



060513 second sequence listing formatted.txt
SEQUENCE LISTING

<110> Solazyme, Inc.
Dillon, Harrison F.

<120> Methods and Compositions for Evolving Microbial Hydrogen Production

<130> H2042101-CIP

<140> US 10/763,712

<141> 2004-01-21

<150> US 10/287,750

<151> 2002-11-04

<150> US 10/411,910

<151> 2003-04-12

<150> US 60/500,032

<151> 2003-09-03

<160> 186

<170> PatentIn version 3.2

<210> 1

<211> 574

<212> PRT

<213> Clostriduim pasteuranum

<400> 1

Met Lys Thr Ile Ile Ile Asn Gly Val Gln Phe Asn Thr Asp Glu Asp
1 5 10 15

Thr Thr Ile Leu Lys Phe Ala Arg Asp Asn Asn Ile Asp Ile Ser Ala
20 25 30

Leu Cys Phe Leu Asn Asn Cys Asn Asn Asp Ile Asn Lys Cys Glu Ile
35 40 45

Cys Thr Val Glu Val Glu Gly Thr Gly Leu Val Thr Ala Cys Asp Thr
50 55 60

Leu Ile Glu Asp Gly Met Ile Ile Asn Thr Asn Ser Asp Ala Val Asn
65 70 75 80

Glu Lys Ile Lys Ser Arg Ile Ser Gln Leu Leu Asp Ile His Glu Phe
85 90 95

Lys Cys Gly Pro Cys Asn Arg Arg Glu Asn Cys Glu Phe Leu Lys Leu
100 105 110

Val Ile Lys Tyr Lys Ala Arg Ala Ser Lys Pro Phe Leu Pro Lys Asp
115 120 125

Lys Thr Glu Tyr Val Asp Glu Arg Ser Lys Ser Leu Thr Val Asp Arg
130 135 140

Thr Lys Cys Leu Leu Cys Gly Arg Cys Val Asn Ala Cys Gly Lys Asn

145					150					155					160
Thr	Glu	Thr	Tyr	Ala	Met	Lys	Phe	Leu	Asn	Lys	Asn	Gly	Lys	Thr	Ile
				165					170					175	
Ile	Gly	Ala	Glu	Asp	Glu	Lys	Cys	Phe	Asp	Asp	Thr	Asn	Cys	Leu	Leu
			180					185					190		
Cys	Gly	Gln	Cys	Ile	Ile	Ala	Cys	Pro	Val	Ala	Ala	Leu	Ser	Glu	Lys
		195					200					205			
Ser	His	Met	Asp	Arg	Val	Lys	Asn	Ala	Leu	Asn	Ala	Pro	Glu	Lys	His
	210					215					220				
Val	Ile	Val	Ala	Met	Ala	Pro	Ser	Val	Arg	Ala	Ser	Ile	Gly	Glu	Leu
225					230					235					240
Phe	Asn	Met	Gly	Phe	Gly	Val	Asp	Val	Thr	Gly	Lys	Ile	Tyr	Thr	Ala
				245					250					255	
Leu	Arg	Gln	Leu	Gly	Phe	Asp	Lys	Ile	Phe	Asp	Ile	Asn	Phe	Gly	Ala
			260					265					270		
Asp	Met	Thr	Ile	Met	Glu	Glu	Ala	Thr	Glu	Leu	Val	Gln	Arg	Ile	Glu
		275					280					285			
Asn	Asn	Gly	Pro	Phe	Pro	Met	Phe	Thr	Ser	Cys	Cys	Pro	Gly	Trp	Val
	290					295					300				
Arg	Gln	Ala	Glu	Asn	Tyr	Tyr	Pro	Glu	Leu	Leu	Asn	Asn	Leu	Ser	Ser
305					310					315					320
Ala	Lys	Ser	Pro	Gln	Gln	Ile	Phe	Gly	Thr	Ala	Ser	Lys	Thr	Tyr	Tyr
				325					330					335	
Pro	Ser	Ile	Ser	Gly	Leu	Asp	Pro	Lys	Asn	Val	Phe	Thr	Val	Thr	Val
			340					345					350		
Met	Pro	Cys	Thr	Ser	Lys	Lys	Phe	Glu	Ala	Asp	Arg	Pro	Gln	Met	Glu
		355					360					365			
Lys	Asp	Gly	Leu	Arg	Asp	Ile	Asp	Ala	Val	Ile	Thr	Thr	Arg	Glu	Leu
	370					375					380				
Ala	Lys	Met	Ile	Lys	Asp	Ala	Lys	Ile	Pro	Phe	Ala	Lys	Leu	Glu	Asp
385					390					395					400
Ser	Glu	Ala	Asp	Pro	Ala	Met	Gly	Glu	Tyr	Ser	Gly	Ala	Gly	Ala	Ile
				405					410					415	
Phe	Gly	Ala	Thr	Gly	Gly	Val	Met	Glu	Ala	Ala	Leu	Arg	Ser	Ala	Lys
			420					425					430		

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Asp Phe Ala Glu Asn Ala Glu Leu Glu Asp Ile Glu Tyr Lys Gln Val
435 440 445

Arg Gly Leu Asn Gly Ile Lys Glu Ala Glu Val Glu Ile Asn Asn Asn
450 455 460

Lys Tyr Asn Val Ala Val Ile Asn Gly Ala Ser Asn Leu Phe Lys Phe
465 470 475 480

Met Lys Ser Gly Met Ile Asn Glu Lys Gln Tyr His Phe Ile Glu Val
485 490 495

Met Ala Cys His Gly Gly Cys Val Asn Gly Gly Gly Gln Pro His Val
500 505 510

Asn Pro Lys Asp Leu Glu Lys Val Asp Ile Lys Lys Val Arg Ala Ser
515 520 525

Val Leu Tyr Asn Gln Asp Glu His Leu Ser Lys Arg Lys Ser His Glu
530 535 540

Asn Thr Ala Leu Val Lys Met Tyr Gln Asn Tyr Phe Gly Lys Pro Gly
545 550 555 560

Glu Gly Arg Ala His Glu Ile Leu His Phe Lys Tyr Lys Lys
565 570

<210> 2
<211> 421
<212> PRT
<213> Desulfovibrio vulgaris

<400> 2

Met Ser Arg Thr Val Met Glu Arg Ile Glu Tyr Glu Met His Thr Pro
1 5 10 15

Asp Pro Lys Ala Asp Pro Asp Lys Leu His Phe Val Gln Ile Asp Glu
20 25 30

Ala Lys Cys Ile Gly Cys Asp Thr Cys Ser Gln Tyr Cys Pro Thr Ala
35 40 45

Ala Ile Phe Gly Glu Met Gly Glu Pro His Ser Ile Pro His Ile Glu
50 55 60

Ala Cys Ile Asn Cys Gly Gln Cys Leu Thr His Cys Pro Glu Asn Ala
65 70 75 80

Ile Tyr Glu Ala Gln Ser Trp Val Pro Glu Val Glu Lys Lys Leu Lys
85 90 95

Asp Gly Lys Val Lys Cys Ile Ala Met Pro Ala Pro Ala Val Arg Tyr
100 105 110

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Ala Leu Gly Asp Ala Phe Gly Met Pro Val Gly Ser Val Thr Thr Gly
115 120 125

Lys Met Leu Ala Ala Leu Gln Lys Leu Gly Phe Ala His Cys Trp Asp
130 135 140

Thr Glu Phe Thr Ala Asp Val Thr Ile Trp Glu Glu Gly Ser Glu Phe
145 150 155 160

Val Glu Arg Leu Thr Lys Lys Ser Asp Met Pro Leu Pro Gln Phe Thr
165 170 175

Ser Cys Cys Pro Gly Trp Gln Lys Tyr Ala Glu Thr Tyr Tyr Pro Glu
180 185 190

Leu Leu Pro His Phe Ser Thr Cys Lys Ser Pro Ile Gly Met Asn Gly
195 200 205

Ala Leu Ala Lys Thr Tyr Gly Ala Glu Arg Met Lys Tyr Asp Pro Lys
210 215 220

Gln Val Tyr Thr Val Ser Ile Met Pro Cys Ile Ala Lys Lys Tyr Glu
225 230 235 240

Gly Leu Arg Pro Glu Leu Lys Ser Ser Gly Met Arg Asp Ile Asp Ala
245 250 255

Thr Leu Thr Thr Arg Glu Leu Ala Tyr Met Ile Lys Lys Ala Gly Ile
260 265 270

Asp Phe Ala Lys Leu Pro Asp Gly Lys Arg Asp Ser Leu Met Gly Glu
275 280 285

Ser Thr Gly Gly Ala Thr Ile Phe Gly Val Thr Gly Gly Val Met Glu
290 295 300

Ala Ala Leu Arg Phe Ala Tyr Glu Ala Val Thr Gly Lys Lys Pro Asp
305 310 315 320

Ser Trp Asp Phe Lys Ala Val Arg Gly Leu Asp Gly Ile Lys Glu Ala
325 330 335

Thr Val Asn Val Gly Gly Thr Asp Val Lys Val Ala Val Val His Gly
340 345 350

Ala Lys Arg Phe Lys Gln Val Cys Asp Asp Val Lys Ala Gly Lys Ser
355 360 365

Pro Tyr His Phe Ile Glu Tyr Met Ala Cys Pro Gly Gly Cys Val Cys
370 375 380

Gly Gly Gly Gln Pro Val Met Pro Gly Val Leu Glu Ala Met Asp Arg
 385 390 395 400

Thr Thr Thr Arg Leu Tyr Ala Gly Leu Lys Lys Arg Leu Ala Met Ala
 405 410 415

Ser Ala Asn Lys Ala
 420

<210> 3
 <211> 468
 <212> PRT
 <213> Entamoeba histolytica
 <400> 3

Met Pro Pro Lys Pro Ser His Thr Leu Thr Gly His Asp His Asn His
 1 5 10 15

Ser Ile Gln Phe Asp Trp Ser Lys Cys Met Gly Cys Gly Met Cys Ala
 20 25 30

Thr Lys Cys Thr Phe Gly Val Leu Val Lys Gln Pro Pro Lys Ile Pro
 35 40 45

Pro Phe Val Gln Pro Asn Arg Glu Lys Leu Ser Gln Glu Asn Thr Asp
 50 55 60

Lys Thr Arg Val Leu Ile Asp Glu Ser Glu Cys Thr Gly Cys Gly Gln
 65 70 75 80

Cys Ser Leu Val Cys Asn Phe Gly Ser Ile Thr Pro Ile Asp His Leu
 85 90 95

Val Asp Thr Phe Lys Ala Lys Glu Ala Gly Lys Lys Leu Val Ala Met
 100 105 110

Ile Ala Pro Ser Thr Arg Leu Gly Val Ala Glu Ala Met Gly Met Pro
 115 120 125

Ile Gly Ser Thr Ala Met Ala Gln Leu Val His Cys Leu Arg Leu Ile
 130 135 140

Gly Phe Asp Tyr Val Phe Asp Val Asp Ala Gly Ala Asp Lys Thr Thr
 145 150 155 160

Met Asp Asp Tyr Ala Glu Val Ile Glu Met Lys Lys Glu Gly Lys Gly
 165 170 175

Pro Ala Ile Thr Ser Cys Cys Pro Ala Trp Ile Glu Leu Val Glu Lys
 180 185 190

Glu Tyr Pro Asp Leu Ile Pro Asn Val Ser Thr Ala Arg Ser Pro Ile
 195 200 205

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Gly Cys Leu Ala Gly Cys Ile Lys Arg Gly Trp Ala Lys Asp Val Gly
 210 215 220

Ile Ala Val Glu Asp Leu Tyr Thr Val Gly Ile Met Pro Cys Ile Ala
 225 230 235 240

Lys Lys Thr Glu Ser Gln Arg Gln Gln Ile His Gln Asp Tyr Asp Ala
 245 250 255

Ser Cys Thr Ser Asn Glu Ile Ala Ala Tyr Phe Lys Lys His Leu Pro
 260 265 270

Pro Glu Glu Cys Lys Phe Thr Gln Glu Arg Glu Glu Ala Leu Ala Lys
 275 280 285

Thr Glu Asp Gly Gln Cys Asp Leu Pro Phe Arg Arg Ile Ser Gly Gly
 290 295 300

Ser Asn Ile Phe Gly Lys Thr Gly Gly Val Cys Glu Thr Val Leu Arg
 305 310 315 320

Val Ile Ala Arg Asn Ala Gly Val Asp Trp Asn Ser Cys Thr Val Asn
 325 330 335

Lys Glu Glu Thr Phe Lys His Ala Ala Ser Gly Ser Thr Met Thr Asn
 340 345 350

Leu Ser Val Asp Ile Gly Gly Thr Ile Ile Thr Gly Ala Val Cys His
 355 360 365

Gly Gly Tyr Ala Ile Arg His Ala Cys Glu Leu Ile Arg Lys Gly Glu
 370 375 380

Leu Lys Val Asp Val Val Glu Met Met Ala Cys Val Gly Gly Cys Leu
 385 390 395 400

Gly Gly Ala Gly Gln Pro Lys Ile Pro Pro Ala Lys Lys Leu Glu Met
 405 410 415

Asp Lys Arg Arg Val Met Leu Asp Ile Leu Asp Gln Gln Thr Asp Ile
 420 425 430

Arg Ala Ala Asn Glu Asn Thr Asp Val Leu Gly Trp Ile Asp Lys His
 435 440 445

Phe Asp His Gln Gly Ala His Gln His Leu His Thr Tyr Phe Thr Pro
 450 455 460

Arg Tyr Gln Asn
 465

<210> 4

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<211> 491

<212> PRT

<213> *Saccharomyces cerevisiae*

<400> 4

Met Ser Ala Leu Leu Ser Glu Ser Asp Leu Asn Asp Phe Ile Ser Pro
1 5 10 15

Ala Leu Ala Cys Val Lys Pro Thr Gln Val Ser Gly Gly Lys Lys Asp
20 25 30

Asn Val Asn Met Asn Gly Glu Tyr Glu Val Ser Thr Glu Pro Asp Gln
35 40 45

Leu Glu Lys Val Ser Ile Thr Leu Ser Asp Cys Leu Ala Cys Ser Gly
50 55 60

Cys Ile Thr Ser Ser Glu Glu Ile Leu Leu Ser Ser Gln Ser His Ser
65 70 75 80

Val Phe Leu Lys Asn Trp Gly Lys Leu Ser Gln Gln Gln Asp Lys Phe
85 90 95

Leu Val Val Ser Val Ser Pro Gln Cys Arg Leu Ser Leu Ala Gln Tyr
100 105 110

Tyr Gly Leu Thr Leu Glu Ala Ala Asp Leu Cys Leu Met Asn Phe Phe
115 120 125

Gln Lys His Phe Gln Cys Lys Tyr Met Val Gly Thr Glu Met Gly Arg
130 135 140

Ile Ile Ser Ile Ser Lys Thr Val Glu Lys Ile Ile Ala His Lys Lys
145 150 155 160

Gln Lys Glu Asn Thr Gly Ala Asp Arg Lys Pro Leu Leu Ser Ala Val
165 170 175

Cys Pro Gly Phe Leu Ile Tyr Thr Glu Lys Thr Lys Pro Gln Leu Val
180 185 190

Pro Met Leu Leu Asn Val Lys Ser Pro Gln Gln Ile Thr Gly Ser Leu
195 200 205

Ile Arg Ala Thr Phe Glu Ser Leu Ala Ile Ala Arg Glu Ser Phe Tyr
210 215 220

His Leu Ser Leu Met Pro Cys Phe Asp Lys Lys Leu Glu Ala Ser Arg
225 230 235 240

Pro Glu Ser Leu Asp Asp Gly Ile Asp Cys Val Ile Thr Pro Arg Glu
245 250 255

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Ile Val Thr Met Leu Gln Glu Leu Asn Leu Asp Phe Lys Ser Phe Leu
260 265 270

Thr Glu Asp Thr Ser Leu Tyr Gly Arg Leu Ser Pro Pro Gly Trp Asp
275 280 285

Pro Arg Val His Trp Ala Ser Asn Leu Gly Gly Thr Cys Gly Gly Tyr
290 295 300

Ala Tyr Gln Tyr Val Thr Ala Val Gln Arg Leu His Pro Gly Ser Gln
305 310 315 320

Met Ile Val Leu Glu Gly Arg Asn Ser Asp Ile Val Glu Tyr Arg Leu
325 330 335

Leu His Asp Asp Arg Ile Ile Ala Ala Ala Ser Glu Leu Ser Gly Phe
340 345 350

Arg Asn Ile Gln Asn Leu Val Arg Lys Leu Thr Ser Gly Ser Gly Ser
355 360 365

Glu Arg Lys Arg Asn Ile Thr Ala Leu Arg Lys Arg Arg Thr Gly Pro
370 375 380

Lys Ala Asn Ser Arg Glu Met Ala Ala Ala Thr Ala Ala Thr Ala Asp
385 390 395 400

Pro Tyr His Ser Asp Tyr Ile Glu Val Asn Ala Cys Pro Gly Ala Cys
405 410 415

Met Asn Gly Gly Gly Leu Leu Asn Gly Glu Gln Asn Ser Leu Lys Arg
420 425 430

Lys Gln Leu Val Gln Thr Leu Asn Lys Arg His Gly Glu Glu Leu Ala
435 440 445

Met Val Asp Pro Leu Thr Leu Gly Pro Lys Leu Glu Glu Ala Ala Ala
450 455 460

Arg Pro Leu Ser Leu Glu Tyr Val Phe Ala Pro Val Lys Gln Ala Val
465 470 475 480

Glu Lys Asp Leu Val Ser Val Gly Ser Thr Trp
485 490

<210> 5
<211> 436
<212> PRT
<213> Chlorella fusca

<400> 5

Met Cys Cys Pro Val Val Ala Ser Arg His Ala Gly Arg Ala Arg His
1 5 10 15

060513 second sequence listing formatted.txt

Val Ala Val Arg Ala Ala Gly Pro Thr Ser Glu Cys Asp Cys Pro Pro
20 25 30

Thr Pro Gln Ala Lys Leu Pro His Trp Gln Gln Ala Leu Asp Glu Leu
35 40 45

Ala Lys Pro Lys Glu Ser Arg Arg Leu Met Ile Ala Gln Ile Ala Ser
50 55 60

Ala Val Arg Val Ala Ile Ala Glu Thr Ile Gly Leu Ala Pro Gly Asp
65 70 75 80

Val Thr Ile Gly Gln Leu Val Thr Gly Leu Arg Met Leu Gly Phe Asp
85 90 95

Tyr Val Phe Asp Thr Leu Phe Gly Ala Asp Leu Thr Ile Met Glu Glu
100 105 110

Gly Thr Glu Leu Leu His Arg Leu Gln Asp His Leu Glu Gln His Pro
115 120 125

Asn Lys Glu Glu Pro Leu Pro Met Phe Thr Ser Cys Cys Pro Gly Trp
130 135 140

Val Ala Met Val Glu Lys Ser Asn Pro Glu Leu Ile Pro Tyr Leu Ser
145 150 155 160

Ser Cys Lys Ser Pro Gln Met Met Leu Gly Ala Val Ile Lys Asn Tyr
165 170 175

Tyr Ala Gln Gln Val Gly Val Gln Pro Ser Asp Ile Cys Asn Val Ser
180 185 190

Val Met Pro Cys Val Arg Lys Gln Gly Glu Ala Asp Arg Glu Trp Phe
195 200 205

Asn Thr Thr Gly Ala Gly Leu Ala Arg Asp Val Asp His Val Val Thr
210 215 220

Thr Ala Glu Val Gly Lys Ile Phe Leu Glu Arg Gly Ile Lys Leu Asn
225 230 235 240

Glu Leu Pro Glu Ser Asn Phe Asp Asn Pro Ile Gly Glu Gly Thr Gly
245 250 255

Gly Ala Leu Leu Phe Gly Thr Thr Gly Gly Val Met Glu Ala Ala Leu
260 265 270

Arg Thr Val Tyr Glu Val Val Thr Gln Lys Pro Met Gly Arg Val Asp
275 280 285

Phe Glu Glu Val Arg Gly Leu Glu Gly Ile Lys Glu Ala Glu Ile Thr

290

295

300

Leu Lys Pro Gly Asp Asp Ser Pro Phe Lys Ala Phe Ala Gly Ala Asp
305 310 315 320

Gly Gln Gly Ile Thr Leu Lys Ile Ala Val Ala Asn Gly Leu Gly Asn
325 330 335

Ala Lys Lys Leu Ile Lys Ser Leu Ser Glu Gly Lys Ala Lys Tyr Asp
340 345 350

Phe Ile Glu Val Met Ala Cys Pro Gly Gly Cys Ile Gly Gly Gly Gly
355 360 365

Gln Pro Arg Ser Thr Asp Lys Gln Ile Leu Gln Lys Arg Gln Gln Ala
370 375 380

Met Tyr Asn Leu Asp Glu Arg Ser Thr Ile Arg Arg Ser His Asp Asn
385 390 395 400

Pro Phe Ile Gln Ala Leu Tyr Asp Lys Phe Leu Gly Ala Pro Asn Ser
405 410 415

His Lys Ala His Asp Leu Leu His Thr His Tyr Val Ala Gly Gly Ile
420 425 430

Pro Glu Glu Lys
435

<210> 6
<211> 574
<212> PRT
<213> Clostridium saccharobutylicum
<400> 6

Met Ile Asn Ile Val Ile Asp Glu Lys Thr Ile Gln Val Gln Glu Asn
1 5 10 15

Thr Thr Val Ile Gln Ala Ala Leu Ala Asn Gly Ile Asp Ile Pro Ser
20 25 30

Leu Cys Tyr Leu Asn Glu Cys Gly Asn Val Gly Lys Cys Gly Val Cys
35 40 45

Ala Val Glu Ile Glu Gly Lys Asn Asn Leu Ala Leu Ala Cys Ile Thr
50 55 60

Lys Val Glu Glu Gly Met Val Val Lys Thr Asn Ser Glu Lys Val Gln
65 70 75 80

Glu Arg Val Lys Met Arg Val Ala Thr Leu Leu Asp Lys His Glu Phe
85 90 95

Lys Cys Gly Pro Cys Pro Arg Arg Glu Asn Cys Glu Phe Leu Lys Leu
 100 105 110
 Val Ile Lys Thr Lys Ala Lys Ala Asn Lys Pro Phe Val Val Glu Asp
 115 120 125
 Lys Ser Gln Tyr Ile Asp Ile Arg Ser Lys Ser Ile Val Ile Asp Arg
 130 135 140
 Thr Lys Cys Val Leu Cys Gly Arg Cys Glu Ala Ala Cys Lys Thr Lys
 145 150 155 160
 Thr Gly Thr Gly Ala Ile Ser Ile Cys Lys Ser Glu Ser Gly Arg Ile
 165 170 175
 Val Gln Ala Thr Gly Gly Lys Cys Phe Asp Asp Thr Asn Cys Leu Leu
 180 185 190
 Cys Gly Gln Cys Val Ala Ala Cys Pro Val Gly Ala Leu Thr Glu Lys
 195 200 205
 Thr His Val Asp Arg Val Lys Glu Ala Leu Glu Asp Pro Asn Lys His
 210 215 220
 Val Ile Val Ala Met Ala Pro Ser Ile Arg Thr Ser Met Gly Glu Leu
 225 230 235 240
 Phe Lys Leu Gly Tyr Gly Val Asp Val Thr Gly Lys Leu Tyr Ala Ser
 245 250 255
 Met Arg Ala Leu Gly Phe Asp Lys Val Phe Asp Ile Asn Phe Gly Ala
 260 265 270
 Asp Met Thr Ile Met Glu Glu Ala Thr Glu Phe Ile Glu Arg Val Lys
 275 280 285
 Asn Asn Gly Pro Phe Pro Met Phe Thr Ser Cys Cys Pro Ala Trp Val
 290 295 300
 Arg Gln Val Glu Asn Tyr Tyr Pro Glu Phe Leu Glu Asn Leu Ser Ser
 305 310 315 320
 Ala Lys Ser Pro Gln Gln Ile Phe Gly Ala Ala Ser Lys Thr Tyr Tyr
 325 330 335
 Pro Gln Ile Ser Gly Ile Ser Ala Lys Asp Val Phe Thr Val Thr Ile
 340 345 350
 Met Pro Cys Thr Ala Lys Lys Phe Glu Ala Asp Arg Glu Glu Met Tyr
 355 360 365
 Asn Glu Gly Ile Lys Asn Ile Asp Ala Val Leu Thr Thr Arg Glu Leu
 370 375 380

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Ala Lys Met Ile Lys Asp Ala Lys Ile Asn Phe Ala Asn Leu Glu Asp
385 390 395 400

Glu Gln Ala Asp Pro Ala Met Gly Glu Tyr Thr Gly Ala Gly Val Ile
405 410 415

Phe Gly Ala Thr Gly Gly Val Met Glu Ala Ala Leu Arg Thr Ala Lys
420 425 430

Asp Phe Val Glu Asp Lys Asp Leu Thr Asp Ile Glu Tyr Thr Gln Ile
435 440 445

Arg Gly Leu Gln Gly Ile Lys Glu Ala Thr Val Glu Ile Gly Gly Glu
450 455 460

Asn Tyr Asn Val Ala Val Ile Asn Gly Ala Ala Asn Leu Ala Glu Phe
465 470 475 480

Met Asn Ser Gly Lys Ile Leu Glu Lys Asn Tyr His Phe Ile Glu Val
485 490 495

Met Ala Cys Pro Gly Gly Cys Val Asn Gly Gly Gly Gln Pro His Val
500 505 510

Ser Ala Lys Glu Arg Glu Lys Val Asp Val Arg Thr Val Arg Ala Ser
515 520 525

Val Leu Tyr Asn Gln Asp Lys Asn Leu Glu Lys Arg Lys Ser His Lys
530 535 540

Asn Thr Ala Leu Leu Asn Met Tyr Tyr Asp Tyr Met Gly Ala Pro Gly
545 550 555 560

Gln Gly Lys Ala His Glu Leu Leu His Leu Lys Tyr Asn Lys
565 570

<210> 7
<211> 421
<212> PRT
<213> Desulfovibrio vulgaris

<400> 7

Met Ser Arg Ile Glu Met Glu Lys Ile Phe Tyr Glu Asp His Ala Pro
1 5 10 15

Asp Pro Lys Ala Asp Pro Asp Lys Leu Phe Phe Ile Gln Ile Asp Glu
20 25 30

Ser Lys Cys Ile Gly Cys Asp Ser Cys Gln Gln Tyr Cys Pro Thr Gly
35 40 45

Ala Ile Phe Gly Asp Thr Gly Asp Ala His Lys Ile Pro His Glu Glu
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50

55

60

Leu Cys Ile Asn Cys Gly Gln Cys Leu Thr His Cys Pro Val Gly Ala
65 70 75 80

Ile Tyr Glu Ser Gln Ser Trp Val Thr Glu Ile Glu Lys Lys Ile Lys
85 90 95

Ala Lys Asp Val Lys Val Ile Ala Met Pro Ala Pro Ala Val Arg Tyr
100 105 110

Ala Leu Gly Asp Ala Phe Gly Leu Pro Val Gly Thr Val Thr Thr Gly
115 120 125

Lys Met Phe Ser Ala Leu Lys Glu Leu Gly Phe Asp His Cys Trp Asp
130 135 140

Asn Glu Phe Thr Ala Asp Val Thr Ile Trp Glu Glu Gly Thr Glu Phe
145 150 155 160

Val Gln Arg Leu Thr Lys Lys Leu Asp Lys Pro Leu Pro Gln Phe Thr
165 170 175

Ser Cys Cys Pro Gly Trp His Lys Tyr Val Glu Ser Leu Tyr Pro Glu
180 185 190

Leu Phe Pro His Met Ser Ser Cys Lys Ser Pro Ile Gly Met Leu Gly
195 200 205

Thr Leu Ala Lys Thr Tyr Gly Ala Asp Arg Met Lys Tyr Asp Arg Ala
210 215 220

Lys Val Tyr Thr Val Ser Ile Met Pro Cys Thr Ala Lys Lys Tyr Glu
225 230 235 240

Gly Met Arg Pro Gln Leu Trp Asp Ser Gly His Lys Asp Ile Asp Ala
245 250 255

Thr Ile Asp Thr Arg Glu Leu Ala Tyr Met Ile Lys Lys Ala Lys Ile
260 265 270

Asp Phe Thr Lys Leu Pro Asp Gly Lys Arg Asp Thr Leu Met Gly Glu
275 280 285

Ser Thr Gly Gly Ala Thr Leu Phe Gly Val Thr Gly Gly Val Met Glu
290 295 300

Ala Ala Leu Arg Tyr Ala Tyr Gln Ala Val Thr Gly Lys Lys Pro Glu
305 310 315 320

Ser Met Asp Phe Lys Gly Val Arg Gly Leu Gln Gly Val Lys Glu Ala
325 330 335

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Thr Val Asn Val Gly Gly Val Asp Val Lys Val Ala Val Val His Gly
340 345 350

Ala Arg Arg Phe His Asp Val Cys Glu Leu Val Lys Ala Gly Lys Ala
355 360 365

Pro Trp His Phe Ile Glu Phe Met Ala Cys Pro Gly Gly Cys Val Cys
370 375 380

Gly Gly Gly Gln Pro Val Met Pro Gly Val Leu Glu Ala Ala Asp Arg
385 390 395 400

Arg Ser Thr Arg Met Tyr Ala Gly Leu Lys Lys Arg Leu Ala Met Ala
405 410 415

Ser Ala Ser Arg Ala
420

<210> 8
<211> 124
<212> PRT
<213> Desulfovibrio vulgaris

<400> 8

Met Gln Ile Val Asn Leu Thr Arg Arg Gly Phe Leu Lys Ala Ala Cys
1 5 10 15

Val Val Thr Gly Gly Ala Leu Ile Ser Ile Arg Met Thr Gly Lys Ala
20 25 30

Val Ala Ala Ala Lys Gln Leu Lys Asp Tyr Met Met Asp Arg Ile Asn
35 40 45

Gly Val Tyr Gly Ala Asp Ala Lys Phe Pro Val Arg Ala Ser Gln Asp
50 55 60

Asn Val Gln Val Gln Lys Leu Tyr Ala Asp Phe Leu Glu Lys Pro Met
65 70 75 80

Ser His Lys Ala Glu Gln Leu Leu His Thr His Trp Val Asp Arg Ser
85 90 95

Lys Ala Ile Glu Arg Met Lys Ala Gln Gly Ala Tyr Pro Asn Pro Arg
100 105 110

Ala Lys Glu Phe Glu Gly Asn Thr Tyr Pro Tyr Glu
115 120

<210> 9
<211> 606
<212> PRT
<213> Desulfovibrio vulgaris

<400> 9

060513 second sequence listing formatted.txt

Met Asn Ala Phe Ile Asn Gly Lys Glu Val Arg Cys Glu Pro Gly Arg
1 5 10 15

Thr Ile Leu Glu Ala Ala Arg Glu Asn Gly His Phe Ile Pro Thr Leu
20 25 30

Cys Glu Leu Ala Asp Ile Gly His Ala Pro Gly Thr Cys Arg Val Cys
35 40 45

Leu Val Glu Ile Trp Arg Asp Lys Glu Ala Gly Pro Gln Ile Val Thr
50 55 60

Ser Cys Thr Thr Pro Val Glu Glu Gly Met Arg Ile Phe Thr Arg Thr
65 70 75 80

Pro Glu Val Arg Arg Met Gln Arg Leu Gln Val Glu Leu Leu Leu Ala
85 90 95

Asp His Asp His Asp Cys Ala Ala Cys Ala Arg His Gly Asp Cys Glu
100 105 110

Leu Gln Asp Val Ala Gln Phe Val Gly Leu Thr Gly Thr Arg His His
115 120 125

Phe Pro Asp Tyr Ala Arg Ser Arg Thr Arg Asp Val Ser Ser Pro Ser
130 135 140

Val Val Arg Asp Met Gly Lys Cys Ile Arg Cys Leu Arg Cys Val Ala
145 150 155 160

Val Cys Arg Asn Val Gln Gly Val Asp Ala Leu Val Val Thr Gly Asn
165 170 175

Gly Ile Gly Thr Glu Ile Gly Leu Arg His Asn Arg Ser Gln Ser Ala
180 185 190

Ser Asp Cys Val Gly Cys Gly Gln Cys Thr Leu Val Cys Pro Val Gly
195 200 205

Ala Leu Ala Gly Arg Asp Asp Val Glu Arg Val Ile Asp Tyr Leu Tyr
210 215 220

Asp Pro Glu Ile Val Thr Val Phe Gln Phe Ala Pro Ala Val Arg Val
225 230 235 240

Gly Leu Gly Glu Glu Phe Gly Leu Pro Pro Gly Ser Ser Val Glu Gly
245 250 255

Gln Val Pro Thr Ala Leu Arg Leu Leu Gly Ala Asp Val Val Leu Asp
260 265 270

Thr Asn Phe Ala Ala Asp Leu Val Ile Met Glu Glu Gly Thr Glu Leu

275

280

285

Leu Gln Arg Leu Arg Gly Gly Ala Lys Leu Pro Leu Phe Thr Ser Cys
 290 295 300
 Cys Pro Gly Trp Val Asn Phe Ala Glu Lys His Leu Pro Asp Ile Leu
 305 310 315 320
 Pro His Val Ser Thr Thr Arg Ser Pro Gln Gln Cys Leu Gly Ala Leu
 325 330 335
 Ala Lys Thr Tyr Leu Ala Arg Thr Met Asn Val Ala Pro Glu Arg Met
 340 345 350
 Arg Val Val Ser Leu Met Pro Cys Thr Ala Lys Lys Glu Glu Ala Ala
 355 360 365
 Arg Pro Glu Phe Arg Arg Asp Gly Val Arg Asp Val Asp Ala Val Leu
 370 375 380
 Thr Thr Arg Glu Phe Ala Arg Leu Leu Arg Arg Glu Gly Ile Asp Leu
 385 390 395 400
 Ala Gly Leu Glu Pro Ser Pro Cys Asp Asp Pro Leu Met Gly Arg Ala
 405 410 415
 Thr Gly Ala Ala Val Ile Phe Gly Thr Thr Gly Gly Val Met Glu Ala
 420 425 430
 Ala Leu Arg Thr Val Tyr His Val Leu Asn Gly Lys Glu Leu Ala Pro
 435 440 445
 Val Glu Leu His Ala Leu Arg Gly Tyr Glu Asn Val Arg Glu Ala Val
 450 455 460
 Val Pro Leu Gly Glu Gly Asn Gly Ser Val Lys Val Ala Val Val His
 465 470 475 480
 Gly Leu Lys Ala Ala Arg Gln Met Val Glu Ala Val Leu Ala Gly Lys
 485 490 495
 Ala Asp His Val Phe Val Glu Val Met Ala Cys Pro Gly Gly Cys Met
 500 505 510
 Asp Gly Gly Gly Gln Pro Arg Ser Lys Arg Ala Tyr Asn Pro Asn Ala
 515 520 525
 Gln Ala Arg Arg Ala Ala Leu Phe Ser Leu Asp Ala Glu Asn Ala Leu
 530 535 540
 Arg Gln Ser His Asn Asn Pro Leu Ile Gly Lys Val Tyr Glu Ser Phe
 545 550 555 560

060513 second sequence listing formatted.txt

Leu Gly Glu Pro Cys Ser Asn Leu Ser His Arg Leu Leu His Thr Arg
565 570 575

Tyr Gly Asp Arg Lys Ser Glu Val Ala Tyr Thr Met Arg Asp Ile Trp
580 585 590

His Glu Met Thr Leu Gly Arg Arg Val Arg Gly Asp Ser Asp
595 600 605

<210> 10
<211> 572
<212> PRT
<213> Clostridium perfringens

<400> 10

Met Asn Lys Ile Ile Ile Asn Asp Lys Thr Ile Glu Phe Asp Gly Asp
1 5 10 15

Lys Thr Ile Leu Asp Leu Ala Arg Glu Asn Gly Phe Asp Ile Pro Val
20 25 30

Leu Cys Glu Leu Lys Asn Cys Gly Asn Lys Gly Gln Cys Gly Val Cys
35 40 45

Leu Val Glu Gln Glu Gly Asn Asp Arg Leu Leu Arg Ser Cys Ala Ile
50 55 60

Lys Ala Lys Asp Gly Met Val Ile Lys Thr Asp Ser Glu Lys Val Leu
65 70 75 80

Glu Ala Arg Lys Glu Arg Val Ala Glu Leu Leu Asp Glu His Glu Phe
85 90 95

Lys Cys Gly Pro Cys Lys Arg Arg Glu Asn Cys Glu Phe Leu Lys Leu
100 105 110

Val Ile Lys Thr Lys Ala Arg Ala His Lys Pro Phe Val Val Ala Asp
115 120 125

Lys Ser Glu Tyr Val Asp Asp Arg Ser Lys Ser Ile Val Leu Asp Arg
130 135 140

Ser Lys Cys Val Lys Cys Gly Arg Cys Val Ala Ala Cys Arg Thr Arg
145 150 155 160

Thr Ala Thr Asn Ser Ile Lys Phe His Arg Ile Asp Gly Val Arg Leu
165 170 175

Val Gly Pro Glu Glu Leu Lys Cys Phe Asp Asp Thr Asn Cys Leu Leu
180 185 190

Cys Gly Gln Cys Ile Ala Ala Cys Pro Val Asp Ala Leu Ser Glu Lys
195 200 205

060513 second sequence listing formatted.txt

Ser His Ile Glu Arg Val Gln Glu Ala Leu Asn Asp Pro Glu Lys His
210 215 220

Val Ile Val Ala Met Ala Pro Ala Val Arg Thr Ser Met Gly Glu Leu
225 230 235 240

Phe Lys Met Gly Tyr Gly Gln Asp Val Thr Gly Lys Leu Tyr Thr Ala
245 250 255

Leu Arg Glu Leu Gly Phe Asp Lys Val Phe Asp Ile Asn Phe Gly Ala
260 265 270

Asp Met Thr Ile Met Glu Glu Ala Thr Glu Leu Ile Glu Arg Ile Lys
275 280 285

Asn Asn Gly Pro Phe Pro Met Leu Thr Ser Cys Cys Pro Ser Trp Val
290 295 300

Arg Glu Val Glu Asn Tyr Phe Pro Glu Leu Val Glu Asn Leu Ser Ser
305 310 315 320

Ala Lys Ser Pro Gln Gln Ile Phe Gly Ala Ala Ser Lys Thr Tyr Tyr
325 330 335

Pro Gln Val Ala Asp Ile Asp Pro Lys Lys Val Phe Thr Val Thr Val
340 345 350

Met Pro Cys Thr Ser Lys Lys Phe Glu Ala Asp Arg Pro Glu Met Glu
355 360 365

Asn Glu Gly Ile Arg Asn Ile Asp Ala Val Ile Thr Thr Arg Glu Leu
370 375 380

Ala Arg Met Ile Lys Ala Ala Lys Ile Asp Phe Ala Lys Leu Glu Asp
385 390 395 400

Gly Glu Val Asp Pro Ala Met Gly Glu Tyr Thr Gly Ala Gly Val Ile
405 410 415

Phe Gly Ala Thr Gly Gly Val Met Glu Ala Ala Leu Arg Thr Ala Lys
420 425 430

Asp Phe Met Glu Asn Asp Asn Leu Asp Asn Val Asp Tyr Glu Ala Val
435 440 445

Arg Gly Leu Ala Gly Ile Lys Glu Ala Glu Val Glu Ile Ala Gly Asn
450 455 460

Glu Tyr Lys Leu Ala Val Val Ser Gly Ala Ala Asn Val Phe Glu Leu
465 470 475 480

Val Lys Ser Gly Lys Ile Asn Asp Tyr His Phe Ile Glu Val Met Ala
 485 490 495

Cys Pro Gly Gly Cys Val Asn Gly Gly Gly Gln Pro His Ile Ser Ala
 500 505 510

Glu Asp Ser Asp Lys Met Asp Ile Arg Glu Val Arg Ala Ser Val Leu
 515 520 525

Tyr Asn Gln Asp Lys Asn Leu Glu Lys Arg Lys Ser His Gln Asn Ser
 530 535 540

Ala Leu Leu Lys Met Tyr Glu Ser Tyr Met Gly Lys Pro Gly His Gly
 545 550 555 560

Arg Ala His Glu Leu Leu His Met Lys Tyr Lys Lys
 565 570

<210> 11
 <211> 572
 <212> PRT
 <213> Clostridium perfringens

<400> 11

Met Asn Lys Ile Ile Ile Asn Asp Lys Thr Ile Glu Phe Asp Gly Asp
 1 5 10 15

Lys Thr Ile Leu Asp Leu Ala Arg Glu Asn Gly Phe Asp Ile Pro Val
 20 25 30

Leu Cys Glu Leu Lys Asn Cys Gly Asn Lys Gly Gln Cys Gly Val Cys
 35 40 45

Leu Val Glu Gln Glu Gly Asn Asp Arg Leu Leu Arg Ser Cys Ala Ile
 50 55 60

Lys Ala Lys Asp Gly Met Val Ile Lys Thr Asp Ser Glu Lys Val Leu
 65 70 75 80

Glu Ala Arg Lys Glu Arg Val Ala Glu Leu Leu Asp Glu His Glu Phe
 85 90 95

Lys Cys Gly Pro Cys Lys Arg Arg Glu Asn Cys Glu Phe Leu Lys Leu
 100 105 110

Val Ile Lys Thr Lys Ala Arg Ala His Lys Pro Phe Val Val Ala Asp
 115 120 125

Lys Ser Glu Tyr Val Asp Asp Arg Ser Lys Ser Ile Val Leu Asp Arg
 130 135 140

Ser Lys Cys Val Lys Cys Gly Arg Cys Val Ala Ala Cys Arg Thr Arg
 145 150 155 160

060513 second sequence listing formatted.txt

Thr Ala Thr Asn Ser Ile Lys Phe His Arg Ile Asp Gly Val Arg Leu
165 170 175

Val Gly Pro Glu Glu Leu Lys Cys Phe Asp Asp Thr Asn Cys Leu Leu
180 185 190

Cys Gly Gln Cys Ile Ala Ala Cys Pro Val Asp Ala Leu Ser Glu Lys
195 200 205

Ser His Ile Glu Arg Val Gln Asp Ala Leu Asn Asp Pro Glu Lys His
210 215 220

Val Ile Val Ala Met Ala Pro Ala Val Arg Thr Ser Met Gly Glu Leu
225 230 235 240

Phe Lys Met Gly Tyr Gly Gln Asp Val Thr Gly Lys Leu Tyr Thr Ala
245 250 255

Leu Arg Glu Leu Gly Phe Asp Lys Val Phe Asp Ile Asn Phe Gly Ala
260 265 270

Asp Met Thr Ile Met Glu Glu Ala Thr Glu Leu Ile Glu Arg Ile Lys
275 280 285

Asn Asn Gly Pro Phe Pro Met Leu Thr Ser Cys Cys Pro Ser Trp Val
290 295 300

Arg Glu Val Glu Asn Tyr Phe Pro Glu Leu Val Glu Asn Leu Ser Ser
305 310 315 320

Ala Lys Ser Pro Gln Gln Ile Phe Gly Ala Ala Ser Lys Thr Tyr Tyr
325 330 335

Pro Gln Val Ala Asp Ile Asp Pro Lys Lys Val Phe Thr Val Thr Val
340 345 350

Met Pro Cys Thr Ser Lys Lys Phe Glu Ala Asp Arg Pro Glu Met Glu
355 360 365

Asn Glu Gly Ile Arg Asn Ile Asp Ala Val Ile Thr Thr Arg Glu Leu
370 375 380

Ala Arg Met Ile Lys Ala Ala Lys Ile Asp Phe Ala Lys Leu Glu Asp
385 390 395 400

Gly Glu Val Asp Pro Ala Met Gly Glu Tyr Thr Gly Ala Gly Val Ile
405 410 415

Phe Gly Ala Thr Gly Gly Val Met Glu Ala Ala Leu Arg Thr Ala Lys
420 425 430

Asp Phe Met Glu Asn Asp Asn Leu Asp Asn Val Asp Tyr Glu Ala Val

435

440

445

Arg Gly Leu Ala Gly Ile Lys Glu Ala Glu Val Glu Ile Ala Gly Asn
 450 455 460

Glu Tyr Lys Leu Ala Val Val Ser Gly Ala Ala Asn Val Phe Glu Leu
 465 470 475 480

Val Lys Ser Gly Lys Ile Asn Asp Tyr His Phe Ile Glu Val Met Ala
 485 490 495

Cys Pro Gly Gly Cys Val Asn Gly Gly Gly Gln Pro His Ile Ser Ala
 500 505 510

Glu Asp Ser Asp Lys Ile Asp Ile Arg Glu Val Arg Ala Ser Val Leu
 515 520 525

Tyr Asn Gln Asp Lys Asn Leu Glu Lys Arg Lys Ser His Gln Asn Ser
 530 535 540

Ala Leu Leu Lys Met Tyr Glu Asn Tyr Met Gly Lys Pro Gly His Gly
 545 550 555 560

Arg Ala His Glu Leu Leu His Met Lys Tyr Lys Lys
 565 570

<210> 12

<211> 484

<212> PRT

<213> Megasphaera elsdenii

<400> 12

Met Pro Glu Phe His Ser Arg Phe Glu Lys Ile Asp Arg Arg Val Pro
 1 5 10 15

Ile Asp Glu His Asn Cys Ala Val Gln Phe Asp Val Thr Lys Cys Lys
 20 25 30

Asn Cys Thr Leu Cys Arg Arg Ala Cys Ala Asp Thr Gln Thr Val Leu
 35 40 45

Asp Tyr Tyr Ser Leu Ser Ser Thr Gly Asp Met Pro Ile Cys Val His
 50 55 60

Cys Gly Gln Cys Ser Ser Ala Cys Pro Phe Gly Ala Ile Val Glu Val
 65 70 75 80

Asn Asp Val Asp Lys Val Lys Ala Ala Leu Lys Asp Pro Glu Lys Ile
 85 90 95

Val Ile Phe Gln Thr Ala Pro Ala Val Arg Val Gly Leu Gly Glu Ala
 100 105 110

Phe Gly Met Asp Pro Gly Thr Phe Val Glu Gly Lys Met Val Ala Ala
 115 120 125
 Leu Arg Thr Leu Gly Ala Asp Tyr Val Phe Asp Thr Asp Phe Gly Ala
 130 135 140
 Asp Leu Thr Ile Met Glu Glu Ala Thr Glu Leu Leu His Arg Leu Gln
 145 150 155 160
 Ser Glu Glu Ile Pro Ile Pro Gln Phe Thr Ser Cys Cys Pro Ala Trp
 165 170 175
 Val Glu Phe Ala Glu Thr Phe Tyr Pro Asp Leu Leu Gln His Leu Ser
 180 185 190
 Ser Thr Lys Ser Pro Ile Ser Ile Leu Ser Pro Val Ile Lys Thr Tyr
 195 200 205
 Phe Ala Gln Gln Lys Asn Ile Asp Pro Lys Lys Ile Val Asn Val Cys
 210 215 220
 Val Thr Pro Cys Thr Ala Lys Lys Ala Glu Ile Arg Arg Pro Glu Leu
 225 230 235 240
 Ser Ala Ser Gly Leu Phe Trp Asp Glu Pro Glu Ile Arg Asp Thr Asp
 245 250 255
 Ile Cys Ile Thr Thr Arg Glu Leu Ala Gln Trp Ile Gln Asp Glu Asn
 260 265 270
 Ile Asp Phe Ala Ser Leu Glu Asp Ser Lys Phe Asp Lys Ala Phe Gly
 275 280 285
 Glu Ala Ser Gly Gly Gly Arg Ile Phe Gly Asn Ser Gly Gly Val Met
 290 295 300
 Glu Ala Ala Ile Arg Thr Ala Tyr His Met Phe Thr Gly Arg Pro Ala
 305 310 315 320
 Pro Lys Asp Phe Ile Pro Phe Glu Pro Val Arg Gly Leu Gln Gly Val
 325 330 335
 Lys Lys Ala Thr Val Ile Phe Gly His Phe Val Leu His Val Ala Ala
 340 345 350
 Ile Ser Gly Leu Gly Asn Ala Arg Ala Phe Ile Asp Asp Leu Ile Lys
 355 360 365
 Asn Asp Ala Phe Glu Asp Tyr Ser Phe Ile Glu Val Met Ala Cys Pro
 370 375 380
 Gly Gly Cys Ile Gly Gly Gly Gly Gln Pro Lys Val Lys Leu Pro Gln
 385 390 395 400

060513 second sequence listing formatted.txt

Val Lys Lys Val Gln Glu Ala Arg Thr Ala Ser Ile Tyr Lys Ser Asp
405 410 415

Glu Glu Thr Asp Ile Lys Ala Ser Trp Gln Asn Pro Glu Ile Glu Thr
420 425 430

Leu Tyr Glu Ala Phe Leu Asp Glu Pro Leu Ser Glu Met Ala Glu Phe
435 440 445

Thr Leu His Thr Tyr Phe Ser Asp Lys Ser Asp Gln Leu Gly Arg Met
450 455 460

Lys Asn Leu Thr Pro Gln Thr Asn Pro Met Ser Pro Lys Tyr Lys Pro
465 470 475 480

Pro Thr Glu Glu

<210> 13
<211> 421
<212> PRT
<213> Desulfovibrio desulfuricans strain

<400> 13

Met Asn Leu Val Glu Met Glu Lys Ile Gln Tyr Val Asp Gln Ser Pro
1 5 10 15

Asp Pro Arg Ala Asn Pro Asp Glu Leu Phe Phe Ile Gln Ile Asp Pro
20 25 30

Glu Lys Cys Ile Gly Cys Asp Thr Cys Gln Glu Tyr Cys Pro Thr Gly
35 40 45

Ala Ile Phe Gly Asp Thr Gly Ser Ala His Ser Ile Pro His Glu Glu
50 55 60

Ile Cys Ile Asn Cys Gly Gln Cys Leu Thr His Cys Pro Val Gly Ala
65 70 75 80

Ile Tyr Glu Val Gln Ser Trp Val Arg Glu Leu Ser Glu Lys Ile Lys
85 90 95

Asp Pro Glu Ile Lys Val Ile Ala Met Pro Ala Pro Ala Val Arg Tyr
100 105 110

Gly Leu Gly Glu Cys Phe Gly Met Pro Val Gly Thr Val Thr Thr Gly
115 120 125

Lys Met Leu Thr Ala Leu Gln Met Leu Gly Phe Asp His Val Trp Asp
130 135 140

Asn Glu Phe Thr Ala Asp Val Thr Ile Trp Glu Glu Gly Thr Glu Phe

145 150 155 160
 Val Asn Arg Leu Thr Gly Gln Ile Asp Lys Pro Leu Pro Gln Phe Thr
 165 170 175
 Ser Cys Cys Pro Gly Trp His Lys Tyr Val Glu Ser Phe Tyr Pro Glu
 180 185 190
 Leu Phe Pro His Leu Ser Ser Cys Lys Ser Pro Ile Gly Met Met Gly
 195 200 205
 Ala Leu Ala Lys Thr Tyr Gly Pro Asp Val Met Lys Tyr Asp Arg Ser
 210 215 220
 Lys Val Tyr Thr Val Ser Ile Met Pro Cys Thr Ala Lys Lys Tyr Glu
 225 230 235 240
 Gly Met Arg Ala Asp Leu Trp Ser Ser Gly Tyr Lys Asp Ile Asp Ala
 245 250 255
 Thr Ile Asp Thr Arg Glu Leu Ala Tyr Met Ile Lys Lys Ala Gly Ile
 260 265 270
 Asp Phe Ala Ala Leu Pro Asp Gly Lys Arg Asp Thr Leu Met Gly Asp
 275 280 285
 Ser Thr Gly Gly Ala Thr Ile Phe Gly Val Ser Gly Gly Val Met Glu
 290 295 300
 Ala Ala Leu Arg Tyr Ala Tyr Glu Ala Val Thr Gly Lys Lys Pro Ser
 305 310 315 320
 Ser Trp Asp Phe Thr Met Val Arg Gly Leu Asn Gly Ile Lys Glu Gly
 325 330 335
 Thr Val Thr Ile Gly Asp Ala Lys Ile Asn Val Ala Val Val His Gly
 340 345 350
 Ala Lys Arg Phe Ala Glu Val Cys Glu Val Ile Lys Thr Gly Lys Ser
 355 360 365
 Pro Trp His Phe Ile Glu Phe Met Ala Cys Pro Gly Gly Cys Val Cys
 370 375 380
 Gly Gly Gly Gln Pro Val Met Pro Gly Val Leu Glu Ala Met Asp Arg
 385 390 395 400
 Lys Val Ser Arg Thr Phe Ala Gly Leu Lys Glu Arg Leu Asn Arg Met
 405 410 415
 Ser Ser Ser Lys Ala
 420

060513 second sequence listing formatted.txt

<210> 14
 <211> 585
 <212> PRT
 <213> Desulfovibrio fructosovorans

<400> 14

Met Ser Met Leu Thr Ile Thr Ile Asp Gly Lys Thr Thr Ser Val Pro
 1 5 10 15

Glu Gly Ser Thr Ile Leu Asp Ala Ala Lys Thr Leu Asp Ile Asp Ile
 20 25 30

Pro Thr Leu Cys Tyr Leu Asn Leu Glu Ala Leu Ser Ile Asn Asn Lys
 35 40 45

Ala Ala Ser Cys Arg Val Cys Val Val Glu Val Glu Gly Arg Arg Asn
 50 55 60

Leu Ala Pro Ser Cys Ala Thr Pro Val Thr Asp Asn Met Val Val Lys
 65 70 75 80

Thr Asn Ser Leu Arg Val Leu Asn Ala Arg Arg Thr Val Leu Glu Leu
 85 90 95

Leu Leu Ser Asp His Pro Lys Asp Cys Leu Val Cys Ala Lys Ser Gly
 100 105 110

Glu Cys Glu Leu Gln Thr Leu Ala Glu Arg Phe Gly Ile Arg Glu Ser
 115 120 125

Pro Tyr Asp Gly Gly Glu Met Ser His Tyr Arg Lys Asp Ile Ser Ala
 130 135 140

Ser Ile Ile Arg Asp Met Asp Lys Cys Ile Met Cys Arg Arg Cys Glu
 145 150 155 160

Thr Met Cys Asn Thr Val Gln Thr Cys Gly Val Leu Ser Gly Val Asn
 165 170 175

Arg Gly Phe Thr Ala Val Val Ala Pro Ala Phe Glu Met Asn Leu Ala
 180 185 190

Asp Thr Val Cys Thr Asn Cys Gly Gln Cys Val Ala Val Cys Pro Thr
 195 200 205

Gly Ala Leu Val Glu His Glu Tyr Ile Trp Glu Val Val Glu Ala Leu
 210 215 220

Ala Asn Pro Asp Lys Val Val Ile Val Gln Thr Ala Pro Ala Val Arg
 225 230 235 240

Ala Ala Leu Gly Glu Asp Leu Gly Val Ala Pro Gly Thr Ser Val Thr
 245 250 255

Gly Lys Met Ala Ala Ala Leu Arg Arg Leu Gly Phe Asp His Val Phe
 260 265 270
 Asp Thr Asp Phe Ala Ala Asp Leu Thr Ile Met Glu Glu Gly Ser Glu
 275 280 285
 Phe Leu Asp Arg Leu Gly Lys His Leu Ala Gly Asp Thr Asn Val Lys
 290 295 300
 Leu Pro Ile Leu Thr Ser Cys Cys Pro Gly Trp Val Lys Phe Phe Glu
 305 310 315 320
 His Gln Phe Pro Asp Met Leu Asp Val Pro Ser Thr Ala Lys Ser Pro
 325 330 335
 Gln Gln Met Phe Gly Ala Ile Ala Lys Thr Tyr Tyr Ala Asp Leu Leu
 340 345 350
 Gly Ile Pro Arg Glu Lys Leu Val Val Val Ser Val Met Pro Cys Leu
 355 360 365
 Ala Lys Lys Tyr Glu Cys Ala Arg Pro Glu Phe Ser Val Asn Gly Asn
 370 375 380
 Pro Asp Val Asp Ile Val Ile Thr Thr Arg Glu Leu Ala Lys Leu Val
 385 390 395 400
 Lys Arg Met Asn Ile Asp Phe Ala Gly Leu Pro Asp Glu Asp Phe Asp
 405 410 415
 Ala Pro Leu Gly Ala Ser Thr Gly Ala Ala Pro Ile Phe Gly Val Thr
 420 425 430
 Gly Gly Val Ile Glu Ala Ala Leu Arg Thr Ala Tyr Glu Leu Ala Thr
 435 440 445
 Gly Glu Thr Leu Lys Lys Val Asp Phe Glu Asp Val Arg Gly Met Asp
 450 455 460
 Gly Val Lys Lys Ala Lys Val Lys Val Gly Asp Asn Glu Leu Val Ile
 465 470 475 480
 Gly Val Ala His Gly Leu Gly Asn Ala Arg Glu Leu Leu Lys Pro Cys
 485 490 495
 Gly Ala Gly Glu Thr Phe His Ala Ile Glu Val Met Ala Cys Pro Gly
 500 505 510
 Gly Cys Ile Gly Gly Gly Gly Gln Pro Tyr His His Gly Asp Val Glu
 515 520 525

Leu Leu Lys Lys Arg Thr Gln Val Leu Tyr Ala Glu Asp Ala Gly Lys
 530 535 540

Pro Leu Arg Lys Ser His Glu Asn Pro Tyr Ile Ile Glu Leu Tyr Glu
 545 550 555 560

Lys Phe Leu Gly Lys Pro Leu Ser Glu Arg Ser His Gln Leu Leu His
 565 570 575

Thr His Tyr Phe Lys Arg Gln Arg Leu
 580 585

<210> 15
 <211> 421
 <212> PRT
 <213> Desulfovibrio fructosovorans

<400> 15

Met Ser Arg Ile Glu Met Ala Lys Ile Phe Tyr Glu Gln Thr Val Pro
 1 5 10 15

Pro Pro Gly Thr Asn Leu Asp Gln Ala Tyr Ile Val Gln Val Asp Glu
 20 25 30

Thr Lys Cys Ile Gly Cys Asp Thr Cys Met Gly Tyr Cys Pro Thr Gly
 35 40 45

Ala Ile Thr Gly Glu Ser Gly Glu Pro His Lys Val Val Asp Pro Ala
 50 55 60

Ala Cys Ile Asn Cys Gly Gln Cys Leu Thr His Cys Pro Val Ala Ala
 65 70 75 80

Ile Tyr Glu Thr Val Ser Phe Val Pro Glu Ile Glu Ala Lys Leu Lys
 85 90 95

Asp Lys Asn Val Lys Val Ile Ala Met Pro Ala Pro Ala Val Arg Tyr
 100 105 110

Ala Leu Gly Asp Pro Phe Gly Met Pro Leu Gly Ala Val Thr Thr Glu
 115 120 125

His Met Leu Thr Gly Leu Lys Gln Leu Gly Phe Asp Asn Val Trp Asp
 130 135 140

Asn Glu Phe Thr Ala Asp Val Thr Ile Trp Glu Glu Gly Ser Glu Leu
 145 150 155 160

Leu Ala Arg Ile Thr Lys Lys Leu Asp Lys Pro Leu Pro Gln Phe Thr
 165 170 175

Ser Cys Cys Pro Gly Trp Gln Lys Tyr Ala Glu Thr Phe Tyr Pro Glu
 180 185 190

060513 second sequence listing formatted.txt

Leu Leu Pro His Phe Ser Ser Cys Lys Ser Pro Ile Gly Met Met Gly
 195 200 205
 Pro Leu Ala Lys Thr Tyr Gly Ala Lys Glu Leu Gly Tyr Glu Pro Lys
 210 215 220
 Gln Ile Tyr Thr Val Ser Ile Met Pro Cys Thr Ala Lys Lys Phe Glu
 225 230 235 240
 Gly Met Arg Pro Glu Met Asp Ala Ser Gly Phe Arg Asp Ile Asp Ala
 245 250 255
 Thr Ile Asn Thr Arg Glu Leu Ala Tyr Met Met Lys Lys Ala Gly Ile
 260 265 270
 Asp Leu Pro Lys Ile Ala Asn Gly Lys Arg Asp Ala Val Met Gly Glu
 275 280 285
 Ser Thr Gly Gly Ala Thr Ile Phe Gly Val Ser Gly Gly Val Met Glu
 290 295 300
 Ala Ala Leu Arg Phe Ala Tyr Gln Ala Leu Thr Lys Lys Pro Pro Gln
 305 310 315 320
 Ser Trp Asp Phe Lys Ala Val Arg Gly Leu Asn Gly Ile Lys Glu Ala
 325 330 335
 Thr Ile Asn Ile Gly Gly Thr Asp Val Lys Val Ala Val Val Asn Gly
 340 345 350
 Gly Lys Asn Phe Ala Lys Val Cys Asp Glu Val Lys Ala Gly Lys Ser
 355 360 365
 Pro Tyr His Phe Ile Glu Phe Met Ala Cys Pro Gly Gly Cys Val Met
 370 375 380
 Gly Gly Gly Gln Pro Ile Met Pro Thr Val Leu Glu Ser Met Asn Arg
 385 390 395 400
 Thr Thr Thr Lys Phe Tyr Ala Ser Leu Lys Lys Arg Leu Ala Leu Tyr
 405 410 415
 Asp Ala Gln Lys Ala
 420
 <210> 16
 <211> 608
 <212> PRT
 <213> Thermotoga maritima
 <400> 16
 Met Arg Arg Phe Phe Lys Asn Asn Leu Arg Asn Leu Ser Gln Asn Gly
 1 5 10 15

060513 second sequence listing formatted.txt

Glu Thr Asn Ser Val Arg Arg Cys Phe Ala Leu Ala Asp Val Thr Val
 20 25 30
 Val Ile Asn Gly Arg Thr Leu Thr Val Pro Asp Asn Leu Thr Val Ile
 35 40 45
 Glu Ala Cys Glu Lys Ala Gly Ile Glu Ile Pro Ala Leu Cys His His
 50 55 60
 Pro Arg Leu Gly Glu Ser Ile Gly Ala Cys Arg Val Cys Val Val Glu
 65 70 75 80
 Val Glu Gly Ala Arg Asn Leu Gln Pro Ala Cys Val Thr Lys Val Arg
 85 90 95
 Asp Gly Met Val Ile Lys Thr Ser Ser Asp Arg Val Lys Thr Ala Arg
 100 105 110
 Lys Phe Asn Leu Ala Leu Leu Leu Ser Glu His Pro Asn Asp Cys Met
 115 120 125
 Thr Cys Glu Ala Asn Gly Arg Cys Glu Phe Gln Asp Leu Ile Tyr Lys
 130 135 140
 Tyr Asp Val Glu Pro Ile Phe Gly Tyr Gly Thr Lys Glu Gly Leu Val
 145 150 155 160
 Asp Arg Ser Ser Pro Ala Ile Val Arg Asp Leu Ser Lys Cys Ile Lys
 165 170 175
 Cys Gln Arg Cys Val Arg Ala Cys Ser Glu Leu Gln Gly Met His Ile
 180 185 190
 Tyr Ser Met Val Glu Arg Gly His Arg Thr Tyr Pro Gly Thr Pro Phe
 195 200 205
 Asp Met Pro Val Tyr Glu Thr Asp Cys Ile Gly Cys Gly Gln Cys Ala
 210 215 220
 Ala Phe Cys Pro Thr Gly Ala Ile Val Glu Asn Ser Ala Val Lys Val
 225 230 235 240
 Val Leu Glu Glu Leu Glu Lys Lys Glu Lys Ile Leu Val Val Gln Thr
 245 250 255
 Ala Pro Ser Val Arg Val Ala Ile Gly Glu Glu Phe Gly Tyr Ala Pro
 260 265 270
 Gly Thr Ile Ser Thr Gly Gln Met Val Ala Ala Leu Arg Arg Leu Gly
 275 280 285

Phe Asp Tyr Val Phe Asp Thr Asn Phe Gly Ala Asp Leu Thr Ile Met
 290 295 300

Glu Glu Gly Ser Glu Phe Leu Glu Arg Leu Glu Lys Gly Asp Leu Glu
 305 310 315 320

Asp Leu Pro Met Phe Thr Ser Cys Cys Pro Gly Trp Val Asn Leu Val
 325 330 335

Glu Lys Val Tyr Pro Glu Leu Arg Thr Arg Leu Ser Ser Ala Lys Ser
 340 345 350

Pro Gln Gly Met Leu Ser Ala Met Val Lys Thr Tyr Phe Ala Glu Lys
 355 360 365

Leu Gly Val Lys Pro Glu Asp Ile Phe His Val Ser Ile Met Pro Cys
 370 375 380

Thr Ala Lys Lys Asp Glu Ala Leu Arg Lys Gln Leu Met Val Asn Gly
 385 390 395 400

Val Pro Ala Val Asp Val Val Leu Thr Thr Arg Glu Leu Gly Lys Leu
 405 410 415

Ile Arg Met Lys Lys Ile Pro Phe Ala Asn Leu Pro Glu Glu Glu Tyr
 420 425 430

Asp Ala Pro Leu Gly Ile Ser Thr Gly Ala Ala Ala Leu Phe Gly Val
 435 440 445

Thr Gly Gly Val Met Glu Ala Ala Leu Arg Thr Ala Tyr Glu Leu Lys
 450 455 460

Thr Gly Lys Ala Leu Pro Lys Ile Val Phe Glu Glu Val Arg Gly Leu
 465 470 475 480

Lys Gly Val Arg Glu Ala Glu Ile Asp Leu Asp Gly Lys Lys Ile Arg
 485 490 495

Ile Ala Val Val His Gly Thr Ala Asn Val Arg Asn Leu Val Glu Lys
 500 505 510

Ile Leu Arg Arg Glu Val Lys Tyr His Phe Val Glu Val Met Ala Cys
 515 520 525

Pro Gly Gly Cys Ile Gly Gly Gly Gly Gln Pro Tyr Ser Arg Asp Pro
 530 535 540

Glu Ile Leu Arg Lys Arg Ala Glu Ala Ile Tyr Thr Ile Asp Glu Arg
 545 550 555 560

Met Thr Leu Arg Lys Ser His Glu Asn Pro Ala Ile Lys Lys Leu Tyr
 565 570 575

Glu Glu Tyr Leu Glu His Pro Leu Ser His Lys Ala His Glu Leu Leu
 580 585 590

His Thr Tyr Tyr Glu Asp Arg Ser Arg Lys Lys Arg Leu Ala Val Lys
 595 600 605

<210> 17
 <211> 645
 <212> PRT
 <213> Thermotoga maritima

<400> 17

Met Lys Ile Tyr Val Asp Gly Arg Glu Val Ile Ile Asn Asp Asn Glu
 1 5 10 15

Arg Asn Leu Leu Glu Ala Leu Lys Asn Val Gly Ile Glu Ile Pro Asn
 20 25 30

Leu Cys Tyr Leu Ser Glu Ala Ser Ile Tyr Gly Ala Cys Arg Met Cys
 35 40 45

Leu Val Glu Ile Asn Gly Gln Ile Thr Thr Ser Cys Thr Leu Lys Pro
 50 55 60

Tyr Glu Gly Met Lys Val Lys Thr Asn Thr Pro Glu Ile Tyr Glu Met
 65 70 75 80

Arg Arg Asn Ile Leu Glu Leu Ile Leu Ala Thr His Asn Arg Asp Cys
 85 90 95

Thr Thr Cys Asp Arg Asn Gly Ser Cys Lys Leu Gln Lys Tyr Ala Glu
 100 105 110

Asp Phe Gly Ile Arg Lys Ile Arg Phe Glu Ala Leu Lys Lys Glu His
 115 120 125

Val Arg Asp Glu Ser Ala Pro Val Val Arg Asp Thr Ser Lys Cys Ile
 130 135 140

Leu Cys Gly Asp Cys Val Arg Val Cys Glu Glu Ile Gln Gly Val Gly
 145 150 155 160

Val Ile Glu Phe Ala Lys Arg Gly Phe Glu Ser Val Val Thr Thr Ala
 165 170 175

Phe Asp Thr Pro Leu Ile Glu Thr Glu Cys Val Leu Cys Gly Gln Cys
 180 185 190

Val Ala Tyr Cys Pro Thr Gly Ala Leu Ser Ile Arg Asn Asp Ile Asp
 195 200 205

Lys Leu Ile Glu Ala Leu Glu Ser Asp Lys Ile Val Ile Gly Met Ile

210

215

220

Ala Pro Ala Val Arg Ala Ala Ile Gln Glu Glu Phe Gly Ile Asp Glu
 225 230 235 240

Asp Val Ala Met Ala Glu Lys Leu Val Ser Phe Leu Lys Thr Ile Gly
 245 250 255

Phe Asp Lys Val Phe Asp Val Ser Phe Gly Ala Asp Leu Val Ala Tyr
 260 265 270

Glu Glu Ala His Glu Phe Tyr Glu Arg Leu Lys Lys Gly Glu Arg Leu
 275 280 285

Pro Gln Phe Thr Ser Cys Cys Pro Ala Trp Val Lys His Ala Glu His
 290 295 300

Thr Tyr Pro Gln Tyr Leu Gln Asn Leu Ser Ser Val Lys Ser Pro Gln
 305 310 315 320

Gln Ala Leu Gly Thr Val Ile Lys Lys Ile Tyr Ala Arg Lys Leu Gly
 325 330 335

Val Pro Glu Glu Lys Ile Phe Leu Val Ser Phe Met Pro Cys Thr Ala
 340 345 350

Lys Lys Phe Glu Ala Glu Arg Glu Glu His Glu Gly Ile Val Asp Ile
 355 360 365

Val Leu Thr Thr Arg Glu Leu Ala Gln Leu Ile Lys Met Ser Arg Ile
 370 375 380

Asp Ile Asn Arg Val Glu Pro Gln Pro Phe Asp Arg Pro Tyr Gly Val
 385 390 395 400

Ser Ser Gln Ala Gly Leu Gly Phe Gly Lys Ala Gly Gly Val Phe Ser
 405 410 415

Cys Val Leu Ser Val Leu Asn Glu Glu Ile Gly Ile Glu Lys Val Asp
 420 425 430

Val Lys Ser Pro Glu Asp Gly Ile Arg Val Ala Glu Val Thr Leu Lys
 435 440 445

Asp Gly Thr Ser Phe Lys Gly Ala Val Ile Tyr Gly Leu Gly Lys Val
 450 455 460

Lys Lys Phe Leu Glu Glu Arg Lys Asp Val Glu Ile Ile Glu Val Met
 465 470 475 480

Ala Cys Asn Tyr Gly Cys Val Gly Gly Gly Gly Gln Pro Tyr Pro Asn
 485 490 495

060513 second sequence listing formatted.txt

Asp Ser Arg Ile Arg Glu His Arg Ala Lys Val Leu Arg Asp Thr Met
500 505 510

Gly Ile Lys Ser Leu Leu Thr Pro Val Glu Asn Leu Phe Leu Met Lys
515 520 525

Leu Tyr Glu Glu Asp Leu Lys Asp Glu His Thr Arg His Glu Ile Leu
530 535 540

His Thr Thr Tyr Arg Pro Arg Arg Arg Tyr Pro Glu Lys Asp Val Glu
545 550 555 560

Ile Leu Pro Val Pro Asn Gly Glu Lys Arg Thr Val Lys Val Cys Leu
565 570 575

Gly Thr Ser Cys Tyr Thr Lys Gly Ser Tyr Glu Ile Leu Lys Lys Leu
580 585 590

Val Asp Tyr Val Lys Glu Asn Asp Met Glu Gly Lys Ile Glu Val Leu
595 600 605

Gly Thr Phe Cys Val Glu Asn Cys Gly Ala Ser Pro Asn Val Ile Val
610 615 620

Asp Asp Lys Ile Ile Gly Gly Ala Thr Phe Glu Lys Val Leu Glu Glu
625 630 635 640

Leu Ser Lys Asn Gly
645

<210> 18
<211> 1206
<212> PRT
<213> Nyctotherus ovalis

<400> 18

Met Ile Ser Arg Leu Ile Ala Lys Lys Ala Pro Leu Phe Leu Arg Thr
1 5 10 15

Phe Ala Thr Ser Glu Met Ile Ser Leu Lys Ile Asp Gly Lys Ile Ile
20 25 30

Ser Val Pro Lys Gly Ile Met Leu Ala Asp Ala Ile Lys Lys Ala Gly
35 40 45

Ala Asn Val Pro Thr Met Cys Tyr His Pro Asp Leu Pro Thr Ser Gly
50 55 60

Gly Ile Cys Arg Val Cys Leu Val Glu Ser Ala Lys Ser Pro Gly Tyr
65 70 75 80

Pro Ile Ile Ser Cys Arg Thr Pro Val Glu Glu Gly Met Glu Ile Val
85 90 95

060513 second sequence listing formatted.txt

Thr Gln Gly Ser Lys Met Lys Glu Tyr Arg Gln Ala Asn Leu Ala Leu
100 105 110

Met Leu Ser Arg His Pro Asn Ala Cys Leu Ser Cys Thr Ser Asn Thr
115 120 125

Asn Cys Lys Thr Gln Glu Leu Ser Ala Asn Met Asn Ile Gly Gln Cys
130 135 140

Gly Phe Ala Asn Ala Thr Pro Pro Lys Asn Asp Asp Ser Tyr Asp Met
145 150 155 160

Thr Thr Ala Ile Glu Arg Asp Asn Asp Lys Cys Ile Asn Cys Asp Ile
165 170 175

Cys Val His Thr Cys Ser Leu Gln Gly Leu Asn Ala Leu Gly Phe Tyr
180 185 190

Asn Glu Glu Gly His Ala Val Lys Ser Met Gly Thr Leu Asp Val Ser
195 200 205

Glu Cys Ile Gln Cys Gly Gln Cys Ile Asn Arg Cys Pro Thr Gly Ala
210 215 220

Ile Thr Glu Lys Ser Glu Ile Arg Pro Val Leu Asp Ala Ile Asn Ile
225 230 235 240

Gln Gln Arg Leu Val Phe Gln Met Ala Pro Ser Ile Arg Val Ala Val
245 250 255

Ala Glu Glu Phe Gly Ile Lys Pro Gly Glu Lys Ile Leu Lys Asn Glu
260 265 270

Ile Ala Thr Ala Leu Arg Lys Leu Gly Ser Asn Val Phe Val Leu Asp
275 280 285

Thr Asn Phe Ser Ala Asp Leu Thr Ile Ile Glu Glu Gly His Glu Leu
290 295 300

Ile Glu Arg Leu Tyr Arg Asn Val Thr Gly Lys Lys Leu Leu Gly Gly
305 310 315 320

Asp His Met Pro Ile Asp Leu Pro Met Leu Thr Ser Cys Cys Pro Gly
325 330 335

Trp Ile Met Phe Ile Glu Lys Asn Tyr Pro Asp Leu Leu Asn Asn Leu
340 345 350

Ser Thr Cys Lys Ser Pro Gln Gly Met Leu Gly Ala Leu Ile Lys Gly
355 360 365

Tyr Trp Ala Lys Asn Ile Lys Lys Met Asp Pro Lys Asp Ile Val Ser
 370 375 380

Val Ser Ile Met Pro Cys Thr Ala Lys Lys Ala Glu Lys Glu Arg Pro
 385 390 400

Gln Leu Arg Gly Asp Glu Gly Tyr Lys Asp Val Asp Tyr Ile Leu Thr
 405 410 415

Thr Arg Glu Leu Ala Lys Met Leu Lys Gln Ser Asn Ile Asp Leu Ala
 420 425 430

Lys Met Glu Pro Thr Pro Phe Asp Lys Val Met Ser Glu Gly Thr Gly
 435 440 445

Ala Ala Val Ile Phe Gly Val Thr Gly Gly Val Met Glu Ala Ala Leu
 450 455 460

Arg Thr Ala Asn Glu Val Ile Thr Gly Arg Glu Val Pro Phe Lys Asn
 465 470 475 480

Leu Asn Ile Glu Ala Val Arg Gly Met Glu Gly Ile Arg Glu Ala Gly
 485 490 495

Ile Lys Leu Glu Asn Val Leu Asp Lys Tyr Lys Ala Phe Glu Gly Val
 500 505 510

Thr Val Lys Val Ala Ile Ala His Gly Pro Asn Asn Ala Arg Lys Val
 515 520 525

Met Asp Ile Ile Lys Gln Ala Lys Glu Ser Gly Lys Pro Ala Pro Trp
 530 535 540

His Phe Val Glu Val Met Ala Cys Pro Gly Gly Cys Ile Gly Gly Gly
 545 550 555 560

Gly Gln Pro Lys Pro Thr Asn Leu Glu Ile Arg Gln Ala Arg Thr Gln
 565 570 575

Leu Thr Phe Lys Glu Asp Met Asp Leu Pro Leu Arg Lys Ser His Asp
 580 585 590

Asn Pro Glu Ile Lys Ala Ile Tyr Glu Asn Tyr Leu Lys Glu Pro Leu
 595 600 605

Gly His Asn Ser His His Tyr Leu His Thr Thr Tyr Ser Ser Gln Lys
 610 615 620

Val Arg Asp Met Asn Leu Tyr Asn Ala Asn Glu Ala Ala Gly Leu Asp
 625 630 635 640

Glu Ile Leu Ala Lys Tyr Pro Lys Glu Lys Glu Tyr Leu Met Pro Ile
 645 650 655

Ile Ile Glu Glu His Asp Lys Lys Gly Tyr Ile Ser Asp Pro Ser Ile
 660 665 670
 Val Lys Ile Ser Glu His Leu Gly Met Tyr Pro Ala Gln Ile Glu Ser
 675 680 685
 Ile Leu Ser Ser Tyr His Tyr Phe Pro Arg Glu His Thr Ile Ala Ile
 690 695 700
 Leu Met Ser Ile Cys Val His Cys His Asn Cys Met Met Lys Gly Gln
 705 710 715 720
 Gly Arg Leu Leu Lys Thr Ile Gln Glu Thr Tyr Asp Ile His Glu Thr
 725 730 735
 His Gly Gly Val Ala Lys Asp Gly Ser Phe Thr Leu His Thr Leu Asn
 740 745 750
 Trp Leu Gly Tyr Cys Val Asn Asp Ala Pro Ala Met Met Ile Lys Arg
 755 760 765
 Lys Gly Thr Asn Tyr Val Glu Thr Phe Thr Gly Leu Leu Gly Asp Asn
 770 775 780
 Ile Asp Gln Arg Leu Lys Ser Leu Lys Asn Leu Lys Lys Glu Leu Pro
 785 790 795 800
 Lys Trp Pro Lys Asn Asn Ile Arg Glu Met Lys Ser Gln Arg Asn Gly
 805 810 815
 Asn Ser Tyr Ser Cys Met Asn Thr Gln Ala Pro Ile Ala Glu Ala Thr
 820 825 830
 Lys Lys Ala Val Ser Met Gly Pro Glu Lys Val Ile Glu Glu Val Phe
 835 840 845
 Lys Ser Asn Leu Val Gly Arg Gly Gly Ala Gly Phe Arg Thr Gly Lys
 850 855 860
 Lys Trp Glu Ser Ala Tyr Lys Thr Pro Ala Ser Asp Lys Tyr Val Val
 865 870 875 880
 Cys Asn Ala Asp Glu Gly Leu Pro Ser Thr Tyr Lys Asp Trp Cys Leu
 885 890 895
 Leu Asn Asn Glu Ala Lys Arg Lys Glu Val Phe Thr Gly Met Gly Ile
 900 905 910
 Cys Ala Lys Thr Ile Gly Ala Lys Arg Cys Phe Met Tyr Leu Arg Tyr
 915 920 925

Glu Tyr Arg Asn Leu Val Pro Ala Leu Glu Gln Ser Ile Lys Asp Val
 930 935 940

Gln Ser Thr Cys Pro Glu Leu Ala Asp Leu Lys Tyr Glu Ile Arg Leu
 945 950 955 960

Gly Gly Gly Pro Tyr Val Ala Gly Glu Glu Asn Ala Gln Phe Glu Ser
 965 970 975

Ile Glu Gly Arg Ala Pro Leu Pro Arg Lys Asp Arg Pro Gly Asn Ile
 980 985 990

Phe Pro Thr Met Glu Gly Leu Phe His Lys Pro Thr Val Ile Asn Asn
 995 1000 1005

Val Glu Thr Phe Phe Ala Ile Pro His Ile Ile Gln Gln Gly Ser
 1010 1015 1020

Gln Ser Phe Gly Glu Gly Lys Met Pro Lys Leu Leu Ser Val Thr
 1025 1030 1035

Gly Asp Val Asp Glu Pro Ile Leu Ile Glu Thr Asn Leu Asn Asn
 1040 1045 1050

Tyr Ser Leu Asn His Leu Leu Gln Glu Ile Ser Ala Lys Asp Ile
 1055 1060 1065

Val Ala Ala Glu Ile Gly Gly Cys Thr Glu Pro Ile Ile Phe Gly
 1070 1075 1080

Ser Lys Phe Asp Thr Leu Phe Gly Phe Gly Arg Gly Thr Leu Asn
 1085 1090 1095

Ala Val Gly Ser Val Val Leu Phe Asn Ser Ser Cys Asp Leu Gly
 1100 1105 1110

Lys Ile Tyr Glu Asn Lys Leu Lys Phe Met Ala Glu Glu Ser Cys
 1115 1120 1125

Lys Gln Cys Val Pro Cys Arg Asp Gly Ser Tyr Ile Phe His Arg
 1130 1135 1140

Ala Phe Lys Glu Leu Arg Asp Thr Gly Lys Ser Ser Tyr Asn Met
 1145 1150 1155

Arg Ala Leu Ala Val Ala Ser Glu Ser Ala Ala Arg Ser Ser Ile
 1160 1165 1170

Cys Ala His Gly Lys Ala Leu Glu Ser Leu Phe Lys Ser Ala Cys
 1175 1180 1185

Asp Phe Met Asn Lys Thr Lys Pro Ile Tyr Gln Pro His Ser Thr
 1190 1195 1200

Tyr His Gln
1205

<210> 19
<211> 467
<212> PRT
<213> Spironucleus barkhanus

<400> 19

Met Lys Val Arg Gln Ser Pro Phe Lys Ile Asp Ile Thr Asn Gly Pro
1 5 10 15

Ile Asp Arg Asn Asp Ala Ile Gln Ile Asp Tyr Gln Lys Cys Ile Gly
20 25 30

Cys Gln Met Cys Ala Lys Thr Cys Thr Asp Ser Gln Asn Phe Asn Ile
35 40 45

Phe Lys Ile Ser Ala Pro Lys Thr Lys Pro Phe Val Asn Ala Tyr Gly
50 55 60

Ser Val Ala Glu Gly Thr Glu Arg Asn Ala Leu Ala Gly Thr Asp Cys
65 70 75 80

Thr Gly Cys Gly Ala Cys Val Arg Ala Cys Pro Val Glu Ala Leu Met
85 90 95

Pro Ala Phe Asn Ile Arg Pro Val Leu Glu Pro Ile Ser Glu Lys Lys
100 105 110

Lys Val Thr Ile Ala Val Ile Ala Pro Ser Thr Arg Val Gly Leu Ala
115 120 125

Glu Gly Met Gly Met Gly Val Gly Val Thr Ala Glu Arg Gln Met Val
130 135 140

Tyr Glu Leu Lys Gln Met Gly Phe Asp Tyr Val Phe Asp Asn Met Trp
145 150 155 160

Gly Ala Asp Ala Pro Thr Thr Glu Asp Ala Lys Glu Ile Leu Lys Ala
165 170 175

Lys Ala Ala Gly Lys Thr Ala Phe Thr Ser Cys Cys Pro Ala Trp Val
180 185 190

Lys Leu Val Glu Thr Thr Tyr Pro Glu Leu Leu Pro Asn Ile Ser Ser
195 200 205

Ala Arg Ser Pro His Gly Ile Ile Cys Ser Val Ile Lys Lys Tyr Phe
210 215 220

Ala Lys Asp Ile Gly Lys Lys Ala Asp Glu Leu Tyr Val Val Gly Val

<210>	20
<211>	468
<212>	PRT
<213>	Trichomonas vaginalis
<400>	20

Met Leu Ala Ser Ser Ala Thr Ala Met Lys Gly Phe Ala Asn Ser Leu
 1 5 10 15
 Arg Met Lys Asp Tyr Ser Ser Thr Gly Ile Asn Phe Asp Met Thr Lys
 20 25 30
 Cys Ile Asn Cys Gln Ser Cys Val Arg Ala Cys Thr Asn Ile Ala Gly
 35 40 45
 Gln Asn Val Leu Lys Ser Leu Thr Val Asn Gly Lys Ser Val Val Gln
 50 55 60
 Thr Val Thr Gly Lys Pro Leu Ala Glu Thr Asn Cys Ile Ser Cys Gly
 65 70 75 80
 Gln Cys Thr Leu Gly Cys Pro Lys Phe Thr Ile Phe Glu Ala Asp Ala
 85 90 95
 Ile Asn Pro Val Lys Glu Val Leu Thr Lys Lys Asn Gly Arg Ile Ala
 100 105 110
 Val Cys Gln Ile Ala Pro Ala Ile Arg Ile Asn Met Ala Glu Ala Leu
 115 120 125
 Gly Val Pro Ala Gly Thr Ile Ser Leu Gly Lys Val Val Thr Ala Leu
 130 135 140
 Lys Arg Leu Gly Phe Asp Tyr Val Phe Asp Thr Asn Phe Ala Ala Asp
 145 150 155 160
 Met Thr Ile Val Glu Glu Ala Thr Glu Leu Val Gln Arg Leu Ser Asp
 165 170 175
 Lys Asn Ala Val Leu Pro Met Phe Thr Ser Cys Cys Pro Ala Trp Val
 180 185 190
 Asn Tyr Val Glu Lys Ser Asp Pro Ser Leu Ile Pro Tyr Leu Ser Ser
 195 200 205
 Cys Arg Ser Pro Met Ser Met Leu Ser Ser Val Ile Lys Asn Val Phe
 210 215 220
 Pro Lys Lys Ile Gly Thr Thr Ala Asp Lys Ile Tyr Asn Val Ala Ile
 225 230 235 240
 Met Pro Cys Thr Arg Lys Lys Asp Glu Ile Gln Arg Ser Gln Phe Thr
 245 250 255
 Met Lys Asp Gly Lys Gln Glu Thr Gly Ala Val Leu Thr Ser Arg Glu
 260 265 270
 Leu Ala Lys Met Ile Lys Glu Ala Lys Ile Asn Phe Lys Glu Leu Pro
 275 280 285

060513 second sequence listing formatted.txt

Asp Thr Pro Cys Asp Asn Phe Tyr Ser Glu Ala Ser Gly Gly Gly Ala
290 295 300

Ile Phe Cys Ala Thr Gly Gly Val Met Glu Ala Ala Val Arg Ser Ala
305 310 315 320

Tyr Lys Phe Leu Thr Lys Lys Glu Leu Ala Pro Ile Asp Leu Gln Asp
325 330 335

Val Arg Gly Val Ala Ser Gly Val Lys Leu Ala Glu Val Asp Ile Ala
340 345 350

Gly Thr Lys Val Lys Val Ala Val Ala His Gly Ile Lys Asn Ala Met
355 360 365

Thr Leu Ile Lys Lys Ile Lys Ser Gly Glu Glu Gln Phe Lys Asp Val
370 375 380

Lys Phe Val Glu Val Met Ala Cys Pro Gly Gly Cys Val Val Gly Gly
385 390 395 400

Gly Ser Pro Lys Ala Lys Thr Lys Lys Ala Val Gln Ala Arg Leu Asn
405 410 415

Ala Thr Tyr Ser Ile Asp Lys Ser Ser Lys His Arg Thr Ser Gln Asp
420 425 430

Asn Pro Gln Leu Leu Gln Leu Tyr Lys Glu Ser Phe Glu Gly Lys Phe
435 440 445

Gly Gly His Val Ala His His Leu Leu His Thr His Tyr Lys Asn Arg
450 455 460

Lys Val Asn Pro
465

<210> 21
<211> 449
<212> PRT
<213> Trichomonas vaginalis

<400> 21

Met Leu Ala Ser Ser Ser Arg Ala Ala Ala Asn Ile Arg Trp Val Asp
1 5 10 15

Thr Ser His Asn Ala Ile Ala Phe Asp Met His Lys Cys Ile Asn Cys
20 25 30

Gln Ala Cys Val Arg Ala Cys Lys Asn Val Ala Gly Gln Ser Val Leu
35 40 45

Lys Ser Val Lys Ile Asn Glu Gly Lys Lys Lys Gly Val Val Gln Thr
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50

55

60

Val Thr Gly Lys Leu Leu Ala Glu Thr Asn Cys Ile Gly Cys Gly Gln
65 70 75 80

Cys Thr Leu Val Cys Pro Thr Gln Ala Ile His Glu Lys Asp Ala Leu
85 90 95

Lys Gln Met Asn Asn Ile Phe Lys Asn Lys Gly Asp Arg Ile Leu Val
100 105 110

Cys Gln Ile Ala Pro Ala Ile Arg Ile Asn Met Arg Arg Pro Trp Cys
115 120 125

Ser Ser Arg Asn Ser Phe His Arg Gln Ser Arg Tyr Ser Pro Gln Arg
130 135 140

Leu Gly Phe Asp Tyr Val Phe Asp Thr Asn Phe Gly Ala Asp Leu Thr
145 150 155 160

Ile Val Glu Glu Ala Thr Glu Leu Leu Gln Arg Leu Asn Asp Pro Lys
165 170 175

Ala Val Leu Pro Met Phe Thr Ser Cys Cys Pro Ala Trp Val Asn Tyr
180 185 190

Val Glu Lys Ser Tyr Pro Gln Trp Met Pro His Leu Ser Thr Cys Arg
195 200 205

Ser Pro Ile Gly Met Leu Ser Ala Val Ile Lys Asn Val Phe Pro Lys
210 215 220

His Ile Gly Val Asp Pro Lys Arg Ile Phe Ser Val Gly Ile Met Pro
225 230 235 240

Cys Thr Ala Lys Lys Asp Glu Ala Ala Arg Glu Gln Leu Met Thr Lys
245 250 255

Ser Gly Leu His Glu Thr Asp Leu Asp Ile Thr Ser Arg Glu Leu Ala
260 265 270

Lys Met Ile Lys Ala Ala Lys Ile Asn Phe Lys Glu Leu Pro Asp Thr
275 280 285

Glu Leu Asp Ser Pro Tyr Ala Met Ala Thr Gly Gly Gly Ala Ile Phe
290 295 300

Cys Ala Thr Gly Gly Val Met Glu Ala Ala Val Arg Ser Ala Tyr Lys
305 310 315 320

Phe Ala Thr Gly Lys Glu Leu Ala Pro Ile Glu Phe Val Gln Val Arg
325 330 335

060513 second sequence listing formatted.txt

Gly Ala Glu Lys Gly Ile Lys Val Gly Thr Val Asp Ile Asn Gly Arg
340 345 350

Glu Ile Lys Val Ala Val Ala Gln Gly Val Lys Asn Ala Met Ser Leu
355 360 365

Ile Lys Lys Ile Glu Glu Gly Gln Asp Asp Val Lys Gly Val Val Phe
370 375 380

Cys Glu Val Met Ala Cys Pro Gly Gly Cys Val Gly Gly Gly Gly Ser
385 390 395 400

Pro Arg Ala Lys Thr Lys Ala Ala Met Asn Lys Arg Leu Asp Ala Thr
405 410 415

Tyr Arg Ile Asp Arg Ala Ser Lys Tyr Arg Thr Pro Gln Asp Asn Thr
420 425 430

Gln Leu Gln Asp Leu Tyr Asn Ala Thr Trp Val Val Ser Leu Val Met
435 440 445

Asp

<210> 22
<211> 589
<212> PRT
<213> Trichomonas vaginalis

<400> 22

Ala Ser Thr Gly Ile Asn Ser Thr Ala Asn Ile Leu Arg Asn Ile Thr
1 5 10 15

Val Thr Val Asn Gly Lys Pro Leu Glu Ala Lys Lys Gly Glu Thr Val
20 25 30

Leu Glu Leu Cys Asp Arg Asn Asn Ile Arg Ile Pro Arg Leu Cys Phe
35 40 45

His Pro Asn Leu Pro Pro Lys Ala Ser Cys Arg Val Cys Leu Val Glu
50 55 60

Cys Asp Gly Lys Trp Leu Ser Pro Ala Cys Val Thr Thr Val Trp Asp
65 70 75 80

Gly Leu Lys Ile Asp Thr Lys Ser Lys Asn Val Arg Asp Ser Val Glu
85 90 95

Asn Asn Leu Lys Glu Leu Leu Asp Cys His Asp Glu Thr Cys Ser Ala
100 105 110

Cys Ile Ala Asn His Arg Cys Gln Phe Arg Asp Met Asn Val Ala Tyr
115 120 125

060513 second sequence listing formatted.txt

Ser Val Lys Ala Glu Thr Lys Glu Ile Cys Ser Glu Glu Gly Ile Asp
130 135 140

Glu Ser Thr Asn Ala Ile Arg Leu Asp Thr Ser Lys Cys Val Leu Cys
145 150 155 160

Gly Arg Cys Ile Arg Ala Cys Glu Glu Val Ala Gly Thr Ser Ala Ile
165 170 175

Ile Phe Gly Asn Arg Ala Lys Lys Met Arg Ile Gln Pro Thr Phe Gly
180 185 190

Val Thr Leu Gln Glu Thr Ser Cys Ile Lys Cys Gly Gln Cys Thr Leu
195 200 205

Tyr Cys Pro Val Gly Ala Ile Thr Glu Lys Ser Gln Val Lys Glu Ala
210 215 220

Leu Asp Ile Leu Ala Asn Lys Gly Lys Lys Ile Thr Val Val Gln Val
225 230 235 240

Ala Pro Ala Val Arg Val Ala Leu Ser Glu Ala Phe Gly Tyr Lys Glu
245 250 255

Gly Thr Val Thr Thr Gly Lys Met Val Ser Ala Leu Lys Ala Leu Gly
260 265 270

Phe Asp Leu Val Tyr Asp Thr Asn Tyr Gly Ala Asp Leu Thr Ile Cys
275 280 285

Glu Glu Ala Gly Glu Leu Val Asn Arg Leu Arg Asp Pro Asn Ala Lys
290 295 300

Phe Pro Met Phe Thr Thr Cys Cys Pro Ala Trp Val Asn Tyr Val Glu
305 310 315 320

Gln Ser Ala Pro Asp Phe Ile Pro Asn Leu Ser Ser Cys Arg Ser Pro
325 330 335

Gln Gly Met Leu Ser Ala Leu Ile Lys Asn Tyr Leu Pro Lys Leu Leu
340 345 350

Asp Val Lys Gln Glu Asp Val Leu Asn Phe Ser Ile Met Pro Cys Thr
355 360 365

Ala Lys Lys Asp Glu Val Glu Arg Pro Glu Leu Arg Thr Lys Ser Gly
370 375 380

Leu Lys Glu Thr Asp Met Val Leu Thr Val Arg Glu Leu Val Glu Met
385 390 395 400

Ile Lys Leu Ser Asn Ile Asp Phe Asn Asn Leu Pro Asp Thr Gln Phe
 405 410 415

Asp Asn Ile Phe Gly Phe Gly Ser Gly Ala Gly Gln Ile Phe Ala Ala
 420 425 430

Thr Gly Gly Val Met Glu Ala Ala Ser Arg Thr Ala Phe Glu Val Tyr
 435 440 445

Thr Gly Lys Lys Leu Thr Asn Val Asn Ile Tyr Pro Val Arg Gly Met
 450 455 460

Asp Gly Leu Arg Ile Ala Glu Leu Asp Leu Asp Gly Thr Lys Leu Lys
 465 470 475 480

Val Ala Val Cys His Gly Ile Ala Asn Thr Ala Lys Leu Leu Asp Arg
 485 490 495

Leu Arg Glu Lys Asp Pro Glu Leu Met Asp Ile Lys Phe Ile Glu Ile
 500 505 510

Met Ala Cys Pro Gly Gly Cys Val Cys Gly Gly Gly Thr Pro Gln Pro
 515 520 525

Lys Asn Arg Val Ser Leu Asp Asn Arg Leu Ala Ala Ile Tyr Asn Ile
 530 535 540

Asp Ala Lys Met Glu Cys Arg Lys Ser His Glu Asn Pro Leu Ile Lys
 545 550 555 560

Gly Val Tyr Lys Glu Phe Leu Gly Lys Pro Asn Ser His Leu Ala His
 565 570 575

Glu Leu Leu His Thr His Phe Lys His His Pro Lys Trp
 580 585

<210> 23
 <211> 582
 <212> PRT
 <213> Trichomonas vaginalis

<400> 23

Met Lys Thr Ile Ile Leu Asn Gly Asn Glu Val His Thr Asp Lys Asp
 1 5 10 15

Ile Thr Ile Leu Glu Leu Ala Arg Glu Asn Asn Val Asp Ile Pro Thr
 20 25 30

Leu Cys Phe Leu Lys Asp Cys Gly Asn Phe Gly Lys Cys Gly Val Cys
 35 40 45

Met Val Glu Val Glu Gly Lys Gly Phe Arg Ala Ala Cys Val Ala Lys
 50 55 60

060513 second sequence listing formatted.txt

Val Glu Asp Gly Met Val Ile Asn Thr Glu Ser Asp Glu Val Lys Glu
 65 70 75 80
 Arg Ile Lys Lys Arg Val Ser Met Leu Leu Asp Lys His Glu Phe Lys
 85 90
 Cys Gly Gln Cys Ser Arg Arg Glu Asn Cys Glu Phe Leu Lys Leu Val
 100 105 110
 Ile Lys Thr Lys Ala Lys Ala Ser Lys Pro Phe Leu Pro Glu Asp Lys
 115 120 125
 Asp Ala Leu Val Asp Asn Arg Ser Lys Ala Ile Val Ile Asp Arg Ser
 130 135 140
 Lys Cys Val Leu Cys Gly Arg Cys Val Ala Ala Cys Lys Gln His Thr
 145 150 155 160
 Ser Thr Cys Ser Ile Gln Phe Ile Lys Lys Asp Gly Gln Arg Ala Val
 165 170 175
 Gly Thr Val Asp Asp Val Cys Leu Asp Asp Ser Thr Cys Leu Leu Cys
 180 185 190
 Gly Gln Cys Val Ile Ala Cys Pro Val Ala Ala Leu Lys Glu Lys Ser
 195 200 205
 His Ile Glu Lys Val Gln Glu Ala Leu Asn Asp Pro Lys Lys His Val
 210 215 220
 Ile Val Ala Met Ala Pro Ser Val Arg Thr Ala Met Gly Glu Leu Phe
 225 230 235 240
 Lys Met Gly Tyr Gly Lys Asp Val Thr Gly Lys Leu Tyr Thr Ala Leu
 245 250 255
 Arg Met Leu Gly Phe Asp Lys Val Phe Asp Ile Asn Phe Gly Ala Asp
 260 265 270
 Met Thr Ile Met Glu Glu Ala Thr Glu Leu Leu Gly Arg Val Lys Asn
 275 280 285
 Asn Gly Pro Phe Pro Met Phe Thr Ser Cys Cys Pro Ala Trp Val Arg
 290 295 300
 Leu Ala Gln Asn Tyr His Pro Glu Leu Leu Asp Asn Leu Ser Ser Ala
 305 310 315 320
 Lys Ser Pro Gln Gln Ile Phe Gly Thr Ala Ser Lys Thr Tyr Tyr Pro
 325 330 335
 Ser Ile Ser Gly Ile Ala Pro Glu Asp Val Tyr Thr Val Thr Ile Met

340

345

350

Pro Cys Asn Asp Lys Lys Tyr Glu Ala Asp Ile Pro Phe Met Glu Thr
 355 360 365

Asn Ser Leu Arg Asp Ile Asp Ala Ser Leu Thr Thr Arg Glu Leu Ala
 370 375 380

Lys Met Ile Lys Asp Ala Lys Ile Lys Phe Ala Asp Leu Glu Asp Gly
 385 390 395 400

Glu Val Asp Pro Ala Met Gly Thr Tyr Ser Gly Ala Gly Ala Ile Phe
 405 410 415

Gly Ala Thr Gly Gly Val Met Glu Ala Ala Ile Arg Ser Ala Lys Asp
 420 425 430

Phe Ala Glu Asn Lys Glu Leu Glu Asn Val Asp Tyr Thr Glu Val Arg
 435 440 445

Gly Phe Lys Gly Ile Lys Glu Ala Glu Val Glu Ile Ala Gly Asn Lys
 450 455 460

Leu Asn Val Ala Val Ile Asn Gly Ala Ser Asn Phe Phe Glu Phe Met
 465 470 475 480

Lys Ser Gly Lys Met Asn Glu Lys Gln Tyr His Phe Ile Glu Val Met
 485 490 495

Ala Cys Pro Gly Gly Cys Ile Asn Gly Gly Gly Gln Pro His Val Asn
 500 505 510

Ala Leu Asp Arg Glu Asn Val Asp Tyr Arg Lys Leu Arg Ala Ser Val
 515 520 525

Leu Tyr Asn Gln Asp Lys Asn Val Leu Ser Lys Arg Lys Ser His Asp
 530 535 540

Asn Pro Ala Ile Ile Lys Met Tyr Asp Ser Tyr Phe Gly Lys Pro Gly
 545 550 555 560

Glu Gly Leu Ala His Lys Leu Leu His Val Lys Tyr Thr Lys Asp Lys
 565 570 575

Asn Val Ser Lys His Glu
 580

<210> 24
 <211> 497
 <212> PRT
 <213> Chlamydomonas reinhardtii
 <400> 24

Met Ser Ala Leu Val Leu Lys Pro Cys Ala Ala Val Ser Ile Arg Gly
 1 5 10 15
 Ser Ser Cys Arg Ala Arg Gln Val Ala Pro Arg Ala Pro Leu Ala Ala
 20 25 30
 Ser Thr Val Arg Val Ala Leu Ala Thr Leu Glu Ala Pro Ala Arg Arg
 35 40 45
 Leu Gly Asn Val Ala Cys Ala Ala Ala Ala Pro Ala Ala Glu Ala Pro
 50 55 60
 Leu Ser His Val Gln Gln Ala Leu Ala Glu Leu Ala Lys Pro Lys Asp
 65 70 75 80
 Asp Pro Thr Arg Lys His Val Cys Val Gln Val Ala Pro Ala Val Arg
 85 90 95
 Val Ala Ile Ala Glu Thr Leu Gly Leu Ala Pro Gly Ala Thr Thr Pro
 100 105 110
 Lys Gln Leu Ala Glu Gly Leu Arg Arg Leu Gly Phe Asp Glu Val Phe
 115 120 125
 Asp Thr Leu Phe Gly Ala Asp Leu Thr Ile Met Glu Glu Gly Ser Glu
 130 135 140
 Leu Leu His Arg Leu Thr Glu His Leu Glu Ala His Pro His Ser Asp
 145 150 155 160
 Glu Pro Leu Pro Met Phe Thr Ser Cys Cys Pro Gly Trp Ile Ala Met
 165 170 175
 Leu Glu Lys Ser Tyr Pro Asp Leu Ile Pro Tyr Val Ser Ser Cys Lys
 180 185 190
 Ser Pro Gln Met Met Leu Ala Ala Met Val Lys Ser Tyr Leu Ala Glu
 195 200 205
 Lys Lys Gly Ile Ala Pro Lys Asp Met Val Met Val Ser Ile Met Pro
 210 215 220
 Cys Thr Arg Lys Gln Ser Glu Ala Asp Arg Asp Trp Phe Cys Val Asp
 225 230 235 240
 Ala Asp Pro Thr Leu Arg Gln Leu Asp His Val Ile Thr Thr Val Glu
 245 250 255
 Leu Gly Asn Ile Phe Lys Glu Arg Gly Ile Asn Leu Ala Glu Leu Pro
 260 265 270
 Glu Gly Glu Trp Asp Asn Pro Met Gly Val Gly Ser Gly Ala Gly Val
 275 280 285

060513 second sequence listing formatted.txt

Leu Phe Gly Thr Thr Gly Gly Val Met Glu Ala Ala Leu Arg Thr Ala
290 295 300

Tyr Glu Leu Phe Thr Gly Thr Pro Leu Pro Arg Leu Ser Leu Ser Glu
305 310 315 320

Val Arg Gly Met Asp Gly Ile Lys Glu Thr Asn Ile Thr Met Val Pro
325 330 335

Ala Pro Gly Ser Lys Phe Glu Glu Leu Leu Lys His Arg Ala Ala Ala
340 345 350

Arg Ala Glu Ala Ala Ala His Gly Thr Pro Gly Pro Leu Ala Trp Asp
355 360 365

Gly Gly Ala Gly Phe Thr Ser Glu Asp Gly Arg Gly Gly Ile Thr Leu
370 375 380

Arg Val Ala Val Ala Asn Gly Leu Gly Asn Ala Lys Lys Leu Ile Thr
385 390 395 400

Lys Met Gln Ala Gly Glu Ala Lys Tyr Asp Phe Val Glu Ile Met Ala
405 410 415

Cys Pro Ala Gly Cys Val Gly Gly Gly Gly Gln Pro Arg Ser Thr Asp
420 425 430

Lys Ala Ile Thr Gln Lys Arg Gln Ala Ala Leu Tyr Asn Leu Asp Glu
435 440 445

Lys Ser Thr Leu Arg Arg Ser His Glu Asn Pro Ser Ile Arg Glu Leu
450 455 460

Tyr Asp Thr Tyr Leu Gly Glu Pro Leu Gly His Lys Ala His Glu Leu
465 470 475 480

Leu His Thr His Tyr Val Ala Gly Gly Val Glu Glu Lys Asp Glu Lys
485 490 495

Lys

<210> 25
<211> 415
<212> PRT
<213> Chlorella fusca

<400> 25

Ala Gly Pro Thr Ser Glu Cys Asp Cys Pro Pro Thr Pro Gln Ala Lys
1 5 10 15

Leu Pro His Trp Gln Gln Ala Leu Asp Glu Leu Ala Lys Pro Lys Glu

20

25

30

Ser Arg Arg Leu Met Ile Ala Gln Ile Ala Ser Ala Val Arg Val Ala
35 40 45

Ile Ala Glu Thr Ile Gly Leu Ala Pro Gly Asp Val Thr Ile Gly Gln
50 55 60

Leu Val Thr Gly Leu Arg Met Leu Gly Phe Asp Tyr Val Phe Asp Thr
65 70 75 80

Leu Phe Gly Ala Asp Leu Thr Ile Met Glu Glu Gly Thr Glu Leu Leu
85 90 95

His Arg Leu Gln Asp His Leu Glu Gln His Pro Asn Lys Glu Glu Pro
100 105 110

Leu Pro Met Phe Thr Ser Cys Cys Pro Gly Trp Val Ala Met Val Glu
115 120 125

Lys Ser Asn Pro Glu Leu Ile Pro Tyr Leu Ser Ser Cys Lys Ser Pro
130 135 140

Gln Met Met Leu Gly Ala Val Ile Lys Asn Tyr Tyr Ala Gln Gln Val
145 150 155 160

Gly Val Gln Pro Ser Asp Ile Cys Asn Val Ser Val Met Pro Cys Val
165 170 175

Arg Lys Gln Gly Glu Ala Asp Arg Glu Trp Phe Asn Thr Thr Gly Ala
180 185 190

Gly Leu Ala Arg Asp Val Asp His Val Val Thr Thr Ala Glu Val Gly
195 200 205

Lys Ile Phe Leu Glu Arg Gly Ile Lys Leu Asn Glu Leu Pro Glu Ser
210 215 220

Asn Phe Asp Asn Pro Ile Gly Glu Gly Thr Gly Gly Ala Leu Leu Phe
225 230 235 240

Gly Thr Thr Gly Gly Val Met Glu Ala Ala Leu Arg Thr Val Tyr Glu
245 250 255

Val Val Thr Gln Lys Pro Met Gly Arg Val Asp Phe Glu Glu Val Arg
260 265 270

Gly Leu Glu Gly Ile Lys Glu Ala Glu Ile Thr Leu Lys Pro Gly Asp
275 280 285

Asp Ser Pro Phe Lys Ala Phe Ala Gly Ala Asp Gly Gln Gly Ile Thr
290 295 300

060513 second sequence listing formatted.txt

Leu Lys Ile Ala Val Ala Asn Gly Leu Gly Asn Ala Lys Lys Leu Ile
 305 310 315 320
 Lys Ser Leu Ser Glu Gly Lys Ala Lys Tyr Asp Phe Ile Glu Val Met
 325 330 335
 Ala Cys Pro Gly Gly Cys Ile Gly Gly Gly Gly Gln Pro Arg Ser Thr
 340 345 350
 Asp Lys Gln Ile Leu Gln Lys Arg Gln Gln Ala Met Tyr Asn Leu Asp
 355 360 365
 Glu Arg Ser Thr Ile Arg Arg Ser His Asp Asn Pro Phe Ile Gln Ala
 370 375 380
 Leu Tyr Asp Lys Phe Leu Gly Ala Pro Asn Ser His Lys Ala His Asp
 385 390 395 400
 Leu Leu His Thr His Tyr Val Ala Gly Gly Ile Pro Glu Glu Lys
 405 410 415
 <210> 26
 <211> 505
 <212> PRT
 <213> Chlamydomonas reinhardtii
 <400> 26
 Met Ala Leu Gly Leu Leu Ala Glu Leu Arg Ala Gly Gln Ala Val Ala
 1 5 10 15
 Cys Ala Arg Arg Thr Asn Ala Pro Ala His Pro Ala Ala Val Val Pro
 20 25 30
 Cys Leu Pro Ser Arg Ala Gly Lys Phe Phe Asn Leu Ser Gln Lys Val
 35 40 45
 Pro Ser Ser Gln Ser Ala Arg Gly Ser Thr Ile Arg Val Ala Ala Thr
 50 55 60
 Ala Thr Asp Ala Val Pro His Trp Lys Leu Ala Leu Glu Glu Leu Asp
 65 70 75 80
 Lys Pro Lys Asp Gly Gly Arg Lys Val Leu Ile Ala Gln Val Ala Pro
 85 90 95
 Ala Val Arg Val Ala Ile Ala Glu Ser Phe Gly Leu Ala Pro Gly Ala
 100 105 110
 Val Ser Pro Gly Lys Leu Ala Thr Gly Leu Arg Ala Leu Gly Phe Asp
 115 120 125
 Gln Val Phe Asp Thr Leu Phe Ala Ala Asp Leu Thr Ile Met Glu Glu
 130 135 140

060513 second sequence listing formatted.txt

Gly Thr Glu Leu Leu His Arg Leu Lys Glu His Leu Glu Ala His Pro
 145 150 155 160
 His Ser Asp Glu Pro Leu Pro Met Phe Thr Ser Cys Cys Pro Gly Trp
 165 170 175
 Val Ala Met Met Glu Lys Ser Tyr Pro Glu Leu Ile Pro Phe Val Ser
 180 185 190
 Ser Cys Lys Ser Pro Gln Met Met Met Gly Ala Met Val Lys Thr Tyr
 195 200 205
 Leu Ser Glu Lys Gln Gly Ile Pro Ala Lys Asp Ile Val Met Val Ser
 210 215 220
 Val Met Pro Cys Val Arg Lys Gln Gly Glu Ala Asp Arg Glu Trp Phe
 225 230 235 240
 Cys Val Ser Glu Pro Gly Val Arg Asp Val Asp His Val Ile Thr Thr
 245 250 255
 Ala Glu Leu Gly Asn Ile Phe Lys Glu Arg Gly Ile Asn Leu Pro Glu
 260 265 270
 Leu Pro Asp Ser Asp Trp Asp Gln Pro Leu Gly Leu Gly Ser Gly Ala
 275 280 285
 Gly Val Leu Phe Gly Thr Thr Gly Gly Val Met Glu Ala Ala Leu Arg
 290 295 300
 Thr Ala Tyr Glu Ile Val Thr Lys Glu Pro Leu Pro Arg Leu Asn Leu
 305 310 315 320
 Ser Glu Val Arg Gly Leu Asp Gly Ile Lys Glu Ala Ser Val Thr Leu
 325 330 335
 Val Pro Ala Pro Gly Ser Lys Phe Ala Glu Leu Val Ala Glu Arg Leu
 340 345 350
 Ala His Lys Val Glu Glu Ala Ala Ala Glu Ala Ala Ala Ala Val
 355 360 365
 Glu Gly Ala Val Lys Pro Pro Ile Ala Tyr Asp Gly Gly Gln Gly Phe
 370 375 380
 Ser Thr Asp Asp Gly Lys Gly Gly Leu Lys Leu Arg Val Ala Val Ala
 385 390 395 400
 Asn Gly Leu Gly Asn Ala Lys Lys Leu Ile Gly Lys Met Val Ser Gly
 405 410 415

Glu Ala Lys Tyr Asp Phe Val Glu Ile Met Ala Cys Pro Ala Gly Cys
 420 425 430

Val Gly Gly Gly Gly Gln Pro Arg Ser Thr Asp Lys Gln Ile Thr Gln
 435 440 445

Lys Arg Gln Ala Ala Leu Tyr Asp Leu Asp Glu Arg Asn Thr Leu Arg
 450 455 460

Arg Ser His Glu Asn Glu Ala Val Asn Gln Leu Tyr Lys Glu Phe Leu
 465 470 475 480

Gly Glu Pro Leu Ser His Arg Ala His Glu Leu Leu His Thr His Tyr
 485 490 495

Val Pro Gly Gly Ala Glu Ala Asp Ala
 500 505

<210> 27
 <211> 403
 <212> PRT
 <213> Scenedesmus obliquus
 <400> 27

Pro His Trp Gln Gln Thr Leu Asp Glu Leu Ala Lys Pro Lys Glu Arg
 1 5 10 15

Lys Val Met Ile Ala Gln Ile Ala Pro Ala Val Arg Gly Ile Ala Glu
 20 25 30

Thr Met Gly Leu Asn Pro Gly Asp Val Thr Val Gly Gln Met Val Thr
 35 40 45

Gly Leu Arg Met Leu Gly Phe Asp Tyr Val Phe Asp Thr Leu Phe Gly
 50 55 60

Ala Asp Leu Thr Ile Met Glu Glu Gly Thr Glu Leu Leu His Arg Leu
 65 70 75 80

Gln Asp His Leu Glu Gln His Pro Asn Lys Glu Glu Pro Leu Pro Met
 85 90 95

Phe Thr Ser Cys Cys Pro Gly Trp Val Ala Met Val Glu Lys Ser Asn
 100 105 110

Pro Glu Leu Ile Pro Tyr Leu Ser Ser Cys Lys Ser Pro Gln Met Met
 115 120 125

Leu Gly Ala Val Ile Lys Asn Tyr Phe Ala Ala Glu Ala Gly Ala Lys
 130 135 140

Pro Glu Asp Ile Cys Asn Val Ser Val Met Pro Cys Val Arg Lys Ser
 145 150 155 160

060513 second sequence listing formatted.txt

Gly Glu Ala Glu Pro Arg Ser Gly Ser Thr His His Arg Ala Gly Arg
165 170 175

Arg Asp Val Asp His Val Met Thr Thr Ala Glu Leu Gly Lys Ile Phe
180 185 190

Val Glu Arg Gly Ile Lys Leu Asn Glu Leu Gln Glu Ser Pro Phe Asp
195 200 205

Asn Pro Val Gly Glu Gly Ser Gly Gly Gly Leu Leu Phe Gly Thr Thr
210 215 220

Gly Gly Val Met Glu Ala Ala Leu Arg Thr Val Tyr Glu Val Val Thr
225 230 235 240

Ala Glu Ala Leu Gly Pro Gln Arg Ser Ser Leu Thr Thr Ser Thr Ala
245 250 255

Trp Thr Pro Ala Gln Arg Ala Ser Pro Arg Pro Ser Pro Gln Ala Pro
260 265 270

Thr Ala Pro Ser Arg Pro Leu Gln Ala Gln Thr Glu Ser Gly Ile Thr
275 280 285

Leu Asn Ile Ala Val Ala Asn Gly Leu Gly Asn Ala Lys Lys Leu Ile
290 295 300

Lys Gln Leu Ala Ala Gly Glu Ser Lys Tyr Asp Phe Thr Glu Val Met
305 310 315 320

Ala Cys Pro Gly Gly Cys Ile Gly Gly Gly Gln Pro Gln Arg Asn
325 330 335

Lys Gln Ile Leu Gln Lys Arg Gln Ala Ala Met Tyr Asp Leu Asp Glu
340 345 350

Arg Ala Val Ile Arg Arg Thr Glu Asn Pro Leu Ile Gly Ala Leu Tyr
355 360 365

Glu Lys Phe Leu Gly Glu Pro Asn Gly His Lys Ala His Glu Leu Leu
370 375 380

His Thr His Tyr Val Ala Gly Gly Val Pro Asp Arg Arg Ser Glu Gly
385 390 395 400

Glu Ala Trp

<210> 28
<211> 581
<212> PRT
<213> Thermoanaerobacter tengcongensis strain MB4T

<400> 28

Met Asp Lys Val Arg Val Thr Ile Asp Gly Ile Thr Val Glu Val Pro
 1 5 10 15

Ser Tyr Tyr Thr Val Leu Glu Ala Ala Lys Glu Ala Gly Ile Asp Ile
 20 25 30

Pro Thr Leu Cys Tyr Leu Lys Glu Ile Asn Gln Ile Gly Ala Cys Arg
 35 40 45

Ile Cys Leu Val Glu Ile Glu Gly Val Arg Asn Leu Gln Thr Ser Cys
 50 55 60

Thr Tyr Pro Val Phe Asp Gly Met Lys Val Tyr Thr Asn Thr Pro Lys
 65 70 75 80

Ile Arg Glu Ala Arg Arg Leu Asn Leu Glu Leu Ile Leu Ser Asn His
 85 90 95

Asp Arg Asn Cys Leu Thr Cys Val Arg Ser Thr Asn Cys Glu Leu Gln
 100 105 110

Ala Leu Ala Lys Arg Leu Gly Val Glu Glu Ile Arg Phe Glu Gly Glu
 115 120 125

Asn Ile Lys Tyr Pro Ile Asp Asp Ala Ser Pro Ala Val Val Arg Asp
 130 135 140

Pro Asn Lys Cys Val Leu Cys Arg Arg Cys Val Ala Val Cys Ser Glu
 145 150 155 160

Val Gln Asn Val Phe Ala Ile Gly Met Val Asn Arg Gly Phe Lys Thr
 165 170 175

Met Val Ala Pro Ser Phe Gly Arg Ser Leu Lys Asp Ser Pro Cys Ile
 180 185 190

Ser Cys Gly Gln Cys Ile Met Val Cys Pro Val Gly Ala Ile Tyr Glu
 195 200 205

Lys Asp His Thr Lys Arg Val Tyr Glu Ala Leu Ala Asp Asp Lys Lys
 210 215 220

Tyr Val Val Ala Gln Thr Ala Pro Ala Val Arg Val Ala Leu Gly Glu
 225 230 235 240

Glu Phe Gly Met Pro Val Gly Thr Ile Val Thr Gly Lys Met Ala Ala
 245 250 255

Ala Leu Arg Arg Met Gly Phe Asp Ala Val Phe Asp Thr Asn Phe Ala
 260 265 270

060513 second sequence listing formatted.txt

Ala Asp Leu Thr Ile Met Glu Glu Gly Ser Glu Leu Leu Glu Arg Ile
275 280 285

Lys His Gly Gly Lys Leu Pro Met Ile Thr Ser Cys Ser Pro Gly Trp
290 295 300

Ile Ala Phe Cys Glu Lys Tyr Tyr Pro Glu Phe Ile Asp Asn Leu Ser
305 310 315 320

Thr Cys Lys Ser Pro His Met Met Met Gly Ala Leu Val Lys Ser Tyr
325 330 335

Tyr Ala Glu Lys Lys Gly Leu Asp Pro Lys Asp Ile Phe Val Val Ser
340 345 350

Ile Met Pro Cys Thr Ala Lys Lys Leu Glu Ile Glu Arg Glu Glu Met
355 360 365

Ile Arg Asn Gly Met Lys Asp Val Asp Ala Val Leu Thr Thr Arg Glu
370 375 380

Leu Ala Arg Met Ile Lys Glu Met Gly Ile Asp Phe Val Asn Leu Lys
385 390 395 400

Asp Glu Glu Phe Asp Glu Pro Leu Gly Met Ser Thr Gly Ala Gly Ala
405 410 415

Ile Phe Gly Ala Thr Gly Gly Val Met Glu Ala Ala Leu Arg Thr Val
420 425 430

Ala Glu Ile Val Glu Gly Arg Asp Ile Gly Lys Ile Asp Phe Glu Glu
435 440 445

Val Arg Gly Leu Glu Gly Val Arg Glu Ala Thr Ile Thr Ile Asp Gly
450 455 460

Met Asp Ile Lys Ile Ala Ile Ala Asn Gly Thr Gly Asn Ala Lys Lys
465 470 475 480

Leu Leu Asp Lys Val Lys Ala Gly Glu Val Glu Tyr His Phe Ile Glu
485 490 495

Val Met Gly Cys Pro Gly Gly Cys Ile Met Gly Gly Gly Gln Pro Ile
500 505 510

His Asn Pro Asn Glu Met Glu Glu Val Lys Lys Leu Arg Ala Lys Ala
515 520 525

Ile Tyr Glu Ile Asp Lys Asn Leu Pro Ile Arg Lys Ser His Glu Asn
530 535 540

Pro Ala Ile Lys Arg Leu Tyr Glu Glu Phe Leu Gly Tyr Pro Leu Ser
545 550 555 560

Glu Lys Ser His Glu Leu Leu His Thr His Tyr Ser Arg Lys Glu Leu
 565 570 575

Tyr Pro Leu Val Lys
 580

<210> 29
 <211> 636
 <212> PRT
 <213> Neocallimastix frontalis
 <400> 29

Met Ser Met Leu Ser Ser Val Leu Asn Lys Ala Val Val Asn Pro Lys
 1 5 10 15

Leu Thr Arg Ser Leu Ala Thr Ala Ala Glu Lys Met Val Asn Ile
 20 25 30

Ser Ile Asn Gly Arg Lys Phe Gln Val Lys Pro Lys Thr Thr Val Leu
 35 40 45

Glu Ala Ala Lys Ala Asn Gly Tyr Tyr Ile Pro Thr Leu Cys Tyr His
 50 55 60

Gln Glu Leu Pro Val Ala Gly Asn Cys Arg Leu Cys Leu Val Tyr Ala
 65 70 75 80

Lys Gly Ser Trp Lys Pro Leu Thr Ala Cys Thr Thr Glu Val Trp Glu
 85 90 95

Gly Met Glu Ile Glu Thr Asp Ser Pro Ala Val Ile Glu Thr Val Arg
 100 105 110

Ser Ser Leu Ser Met Met Arg Glu Glu His Pro Asn Asp Cys Met Thr
 115 120 125

Cys Gly Ser Asn Gly Asp Cys Glu Phe Gln Asp Leu Ile Tyr Arg Tyr
 130 135 140

Gln Ile Asp Ala Lys His Pro Val Arg Ser Leu Leu Lys His Lys Ser
 145 150 155 160

Lys Lys Thr Asn His Ser Ile Thr Glu Pro Cys Tyr Ser Pro Phe Asp
 165 170 175

Asn Thr Thr Phe Ser Val Ala Arg Asp Met Asn Lys Cys Val Lys Cys
 180 185 190

Gly Arg Cys Ile Arg Ala Cys His His Phe Gln Asn Ile Asn Ile Leu
 195 200 205

Gly Phe Ile Asn Arg Ala Gly Tyr Glu Arg Val Gly Thr Pro Met Asp
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215

220

Arg Pro Met Asn Phe Thr Lys Cys Val Glu Cys Gly Gln Cys Ser Gln
 225 230 235 240

Val Cys Pro Val Gly Ala Ile Thr Ala Arg Thr Glu Val Val Asp Val
 245 250 255

Leu Arg His Leu Asp Thr Lys Arg Lys Val Val Val Cys Ser Thr Ala
 260 265 270

Pro Ala Ile Arg Val Ala Pro Ala Glu Glu Phe Ser Thr Glu Ala Asp
 275 280 285

Phe Asp Phe Thr Gly Lys Met Val Ala Gly Leu Arg Lys Leu Gly Phe
 290 295 300

Asp Tyr Ile Phe Asp Thr Asn Phe Ser Ala Asp Leu Thr Ile Met Glu
 305 310 315 320

Glu Gly Thr Glu Leu Ile Asp Arg Leu Asn Asn Gly Gly Lys Phe Pro
 325 330 335

Met Phe Thr Ser Cys Cys Pro Gly Trp Ile Asn Met Val Glu Lys Ser
 340 345 350

Tyr Pro Glu Leu Ser Asp Asn Leu Ser Ser Cys Lys Ser Pro Gln Gln
 355 360 365

Met Ile Gly Ala Val Ile Lys Ser Tyr Phe Ala Lys Lys Leu Gly Leu
 370 375 380

Ser Thr Glu Asp Ile Ile His Val Ser Ile Met Pro Cys Thr Ala Lys
 385 390 395 400

Lys Gly Glu Ala Arg Arg Pro Glu Phe Val Gln Lys Gly Lys Asp Gly
 405 410 415

Lys Asp Tyr Pro Asp Ile Asp Tyr Val Ile Thr Thr Arg Glu Leu Leu
 420 425 430

Thr Leu Leu Lys Leu Lys Lys Ile Asn Pro Ala Glu Leu Pro Asp Asp
 435 440 445

Lys Phe Asp Ser Pro Leu Gly Ile Gly Ser Ser Ala Gly Asn Leu Phe
 450 455 460

Gly Val Thr Gly Gly Val Met Glu Ala Ala Ile Arg Thr Ala Gln Val
 465 470 475 480

Ile Thr Gly Val Glu Asn Pro Ile Pro Leu Gly Glu Leu Lys Ala Ile
 485 490 495

060513 second sequence listing formatted.txt

Arg Gly Leu Asp Gly Ile Lys Ala Ala Asn Val Pro Leu Lys Thr Lys
500 505 510

Asp Gly Lys Glu Val Ser Val Arg Ala Ala Val Val Ser Gly Gly Ala
515 520 525

Asn Ile Gln Lys Phe Leu Glu Lys Ile Lys Asn Lys Glu Leu Glu Phe
530 535 540

Asp Phe Ile Glu Met Met Met Cys Pro Gly Gly Cys Ile Asn Gly Gly
545 550 555 560

Gly Gln Pro Lys Ser Ala Asp Pro Glu Ile Val Ala Lys Lys Met Gln
565 570 575

Arg Met Tyr Thr Met Asp Asp Gln Ala Lys Leu Arg Leu Cys His Glu
580 585 590

Asn Pro Glu Ile Ile Asp Val Tyr Lys Asn Phe Leu Gly Glu Pro Asn
595 600 605

Ser His Leu Ala His Glu Leu Leu His Thr His Tyr Asn Asp Arg Ser
610 615 620

Lys Thr Ile His Asp Met Gly His His Glu Lys Lys
625 630 635

<210> 30
<211> 555
<212> PRT
<213> Piromyces sp. E2

<400> 30

Cys Leu Val Asp Val Lys Gly Ser Trp Lys Pro Leu Thr Ala Cys Thr
1 5 10 15

Thr Glu Val Trp Glu Gly Met Glu Ile Glu Thr Asp Thr Pro Ala Val
20 25 30

Arg Glu Thr Val Arg Ser Ser Leu Ala Met Met Arg Glu Glu His Pro
35 40 45

Asn Asp Cys Met Thr Cys Glu Ser Asn Gly Asn Cys Glu Phe Gln Asp
50 55 60

Leu Ile Tyr Arg Tyr Gln Ile Asp Ala Gln His Pro Val Arg Thr Leu
65 70 75 80

Leu Arg Asn Lys Phe Lys Lys Thr Asn His Ser Ile Thr Glu Pro Cys
85 90 95

Tyr Ser Pro Phe Asp Asp Ser Thr Phe Ser Ile Ser Arg Asp Met Asn
100 105 110

060513 second sequence listing formatted.txt

Lys Cys Val Lys Cys Gly Arg Cys Val Arg Ala Cys His His Phe Gln
 115 120 125
 Asn Ile Asn Ile Leu Gly Phe Ile Asn Arg Ala Gly Tyr Glu Arg Val
 130 135 140
 Gly Thr Pro Met Asp Arg Pro Met Asn Phe Thr Lys Cys Val Glu Cys
 145 150 155 160
 Gly Gln Cys Ser Gln Val Cys Pro Val Gly Ala Ile Thr Glu Arg Asn
 165 170 175
 Glu Cys Ile Glu Val Leu Arg His Leu Asp Thr Lys Arg Lys Ile Val
 180 185 190
 Val Val Ser Thr Ala Pro Ala Ile Arg Val Ala Leu Ala Glu Glu Phe
 195 200 205
 Asn Ala Glu Pro Asp Phe Asp Phe Thr Gly Lys Met Val Ala Gly Leu
 210 215 220
 Lys Lys Leu Gly Phe Asp Tyr Ile Phe Asp Thr Asn Phe Ser Ala Asp
 225 230 235 240
 Leu Thr Ile Met Glu Glu Gly Thr Glu Leu Ile Thr Arg Leu Asn Glu
 245 250 255
 Gly Gly Lys Phe Pro Met Phe Thr Ser Cys Cys Pro Gly Trp Ile Asn
 260 265 270
 Met Val Glu Lys Ser Tyr Pro Glu Ile Arg Asp Asn Leu Ser Ser Cys
 275 280 285
 Lys Ser Pro Gln Gln Met Ile Gly Ala Val Ile Lys Thr Tyr Phe Ala
 290 295 300
 Lys Lys Ile Asn Ala Lys Pro Glu Asp Ile Ile His Val Ser Val Met
 305 310 315 320
 Pro Cys Thr Ala Lys Lys Gly Glu Ala Lys Arg Pro Glu Phe Lys Arg
 325 330 335
 Asp Gly Val Pro Asp Ile Asp His Val Ile Thr Thr Arg Glu Leu Ile
 340 345 350
 Thr Leu Leu Lys Leu Lys Arg Ile Asn Pro Ser Glu Leu Lys Asn Glu
 355 360 365
 Lys Phe Asp Ser Pro Leu Gly Ile Gly Ser Ser Ala Gly Asn Leu Phe
 370 375 380

Gly Val Thr Gly Gly Val Met Glu Ala Ala Val Arg Thr Ala Gln Ile
385 390 395 400

Ile Thr Gly Val Glu Asn Pro Ile Pro Leu Gly Glu Leu Lys Ala Ile
405 410 415

Arg Gly Leu Asp Gly Ile Lys Ala Ala Ser Val Pro Leu Lys Thr Lys
420 425 430

Asp Gly Lys Asp Val Asn Val Arg Ala Ala Val Val Ser Gly Gly Ala
435 440 445

Asn Ile Gln Lys Phe Leu Glu Lys Leu Lys Lys Lys Glu Leu Glu Phe
450 455 460

Asp Phe Val Glu Met Met Met Cys Pro Gly Gly Cys Ile Asn Gly Gly
465 470 475 480

Gly Gln Pro Lys Ser Ala Asp Pro Lys Val Val Ala Lys Lys Met Glu
485 490 495

Arg Met Tyr Thr Met Asp Asp Gln Ala Ser Leu Arg Leu Ser His Glu
500 505 510

Asn Pro Glu Ile Thr Gln Ile Tyr Lys Glu Phe Leu Lys Glu Pro Asn
515 520 525

Gly His Leu Ser His Glu Leu Leu His Thr His Tyr Asn Asp Arg Ser
530 535 540

Lys Ala Ile Gln Asp Met Ser Leu His Gln Lys
545 550 555

<210> 31

<211> 389

<212> PRT

<213> Neocallimastix frontalis

<400> 31

Thr Glu Arg Asn Glu Val Ile Glu Val Leu Arg Gln Leu Asp Ser Lys
1 5 10 15

Arg Lys Ile Leu Val Cys Ser Thr Ala Pro Ala Ile Arg Val Ala Leu
20 25 30

Ala Glu Glu Phe Asn Ala Asp Pro Asp Phe Asn Phe Thr Gly Lys Met
35 40 45

Val Ala Gly Leu Arg Lys Leu Gly Phe Asp Tyr Ile Phe Asp Thr Asn
50 55 60

Phe Ser Ala Asp Leu Thr Ile Met Glu Glu Gly Thr Glu Leu Ile Asn
65 70 75 80

060513 second sequence listing formatted.txt

Arg Leu Asn Asn Gly Gly Lys Phe Pro Met Phe Thr Ser Cys Cys Pro
85 90 95

Gly Trp Ile Asn Met Val Glu Lys Ser Tyr Pro Glu Leu Arg Glu Asn
100 105 110

Leu Ser Thr Cys Lys Ser Pro Gln Gln Met Ile Gly Ala Leu Ile Lys
115 120 125

Ser Tyr Phe Ala Lys Lys Leu Gly Val Ser Thr Glu Asp Ile Ile His
130 135 140

Val Ser Val Met Pro Cys Thr Ala Lys Lys Gly Glu Ala Lys Arg Pro
145 150 155 160

Glu Phe Val Gln Lys Gly Lys Asp Gly Lys Asn Tyr Pro Asp Ile Asp
165 170 175

Tyr Val Leu Thr Thr Arg Glu Leu Leu Thr Leu Met Lys Leu Lys Lys
180 185 190

Val Asn Pro Ala Glu Leu Ala Asp Asp Lys Leu Asp Ser Pro Leu Gly
195 200 205

Ile Ser Ser Ser Ala Gly Asn Leu Phe Gly Val Thr Gly Gly Val Met
210 215 220

Glu Ala Ala Val Arg Thr Ala Gln Ile Ile Thr Gly Val Glu Asn Pro
225 230 235 240

Ile Pro Leu Gly Glu Leu Lys Ala Val Arg Gly Leu Glu Gly Ile Lys
245 250 255

Ala Ala Thr Val Pro Leu Lys Thr Lys Glu Gly Lys Asp Ile Asn Val
260 265 270

Arg Ala Ala Val Val Ser Gly Gly Ala Asn Ile Gln Lys Phe Leu Glu
275 280 285

Lys Ile Lys Asn Lys Glu Val Glu Phe Asp Phe Val Glu Met Met Met
290 295 300

Cys Pro Gly Gly Cys Ile Asn Gly Gly Gly Gln Pro Lys Ser Ala Asp
305 310 315 320

Pro Lys Ile Val Thr Lys Lys Met Gln Arg Met Tyr Thr Met Asp Glu
325 330 335

Gln Ala Thr Leu Arg Leu Ser His Glu Asn Glu Glu Val Lys Gln Ile
340 345 350

Tyr Lys Glu Phe Leu Ile Glu Pro Asn Gly His Leu Ser His Glu Leu

355

360

365

Leu His Thr His Tyr Asn Asp Arg Ser Lys Ala Ile Gln Asp Met Ser
 370 375 380

Leu His Glu Lys Lys
 385

<210> 32
 <211> 458
 <212> PRT
 <213> Desulfovibrio desulfuricans

<400> 32

Met Asn Gly Gln Gln Asn Val Ile Arg Ile Asp Ser Asp Ile Cys Thr
 1 5 10 15

Gly Cys Gly Arg Cys Lys Asp Val Cys Pro Val Gly Ala Val Glu Gly
 20 25 30

Val Gln Gly Thr Pro His Ser Ile Arg Glu Asp Val Cys Val Leu Cys
 35 40 45

Gly Gln Cys Val Gln Gln Cys Ser Ala Phe Ala Ser Phe Tyr Glu Gln
 50 55 60

His Pro Ala Cys Ile Ala Glu Lys Lys Arg Glu Arg Gly Leu Phe Val
 65 70 75 80

Ser Glu Ala Ala Pro Leu Phe Ala Ala Trp His Thr Gly Asp Ala Pro
 85 90 95

Arg Val Ala Gly Arg Leu Ala Glu Gly Cys His Ser Met Val Gln Cys
 100 105 110

Ala Pro Ala Val Arg Ala Ala Ile Gly Glu Glu Phe Gly Met Pro Ala
 115 120 125

Gly Ala Leu Thr Pro Gly Arg Leu Ala Ala Ala Leu Arg Arg Leu Gly
 130 135 140

Phe Asp Arg Val Tyr Asp Thr Asn Phe Ala Ala Asp Leu Thr Ile Met
 145 150 155 160

Glu Glu Gly Ser Glu Leu Leu Gln Arg Met Glu Gly Ala Gly Pro Leu
 165 170 175

Pro Met Phe Thr Ser Cys Cys Pro Ala Trp Val Arg Tyr Ala Glu Gln
 180 185 190

Gln Phe Pro Asp Leu Leu Glu His Leu Ser Ser Cys Lys Ser Pro Gln
 195 200 205

060513 second sequence listing formatted.txt

Gln Met Ala Gly Ala Val Phe Lys Ser Tyr Gly Ala Gln Leu Asp Gly
 210 215 220

Val Asp Pro Arg Gln Val Phe Ser Val Ala Val Met Pro Cys Thr Cys
 225 230 235 240

Lys Lys Ala Glu Ala Gln Arg Pro Gly Met Glu His Asp Gly Val Arg
 245 250 255

Asp Val Asp Ala Val Leu Thr Thr Gly Glu Leu Ala Ala Met Leu Arg
 260 265 270

Gln Ala His Ile Asp Phe Ala Ala Leu Pro Asp Glu Pro Phe Asp Arg
 275 280 285

Pro Leu Gly Ser Tyr Ser Gly Ala Gly Asn Ile Phe Gly Leu Thr Gly
 290 295 300

Gly Val Met Glu Ala Ala Leu Arg Thr Ala Tyr Glu Leu Val Thr Gly
 305 310 315 320

Glu Pro Val Pro Cys Thr Glu Leu Val Tyr Val Arg Gly Gly Glu Gly
 325 330 335

Ile Arg His Ala Thr Leu Thr Met Asp Gly Arg Thr Phe Arg Val Ala
 340 345 350

Val Val Ala Gly Leu Gln His Val Arg Pro Leu Leu Glu Ala Val Arg
 355 360 365

Ala Gly Thr Cys Asp Val Asn Phe Val Glu Val Met Cys Cys Pro Gln
 370 375 380

Gly Cys Ile Ser Gly Gly Gly Gln Pro Lys Val Leu Leu Pro Phe Gln
 385 390 395 400

Arg Asp Glu Val Tyr Ala Ala Arg Lys Ala Ala Leu Tyr Arg His Asp
 405 410 415

Ala Glu Leu Ala Cys Arg Lys Ser His Glu Asn Pro Gln Val Gln Ala
 420 425 430

Leu Tyr Arg Glu Phe Leu Gly Glu Pro Leu Ser His Val Ser His Asn
 435 440 445

Leu Leu His Thr Val Tyr Gly Gln Thr Arg
 450 455

<210> 33
 <211> 554
 <212> PRT
 <213> Desulfitobacterium hafniense
 <400> 33

060513 second sequence listing formatted.txt

Met Met Gln Leu Lys His Pro Phe Gln Ser Gly Phe Gln Gln Gln Ser
1 5 10 15

Cys Lys Arg His Thr Lys Lys Val Val Val Asp Met Glu Ser Lys Ala
20 25 30

Gly Lys Gly Ser Asn Leu Ser Arg Arg Ser Phe Leu Lys Phe Ala Gly
35 40 45

Gly Ala Gly Ile Ala Gly Ala Ser Leu Ser Leu Thr Gly Cys Gly Gln
50 55 60

Pro Leu Thr Pro Ala Ser Ala Val Gly Gly Glu Gly Trp Met Pro Thr
65 70 75 80

Gln Tyr Asn Glu Pro Gly Gly Trp Pro Thr Asn Val Arg Gly Arg Val
85 90 95

Pro Ile Asp Pro Glu Asn Pro Ala Leu Arg Arg Asp Asp Gln Lys Cys
100 105 110

Ile Leu Cys Gly Gln Cys Ile Glu Val Cys Lys Thr Ile Gln Ser Val
115 120 125

Tyr Gly Asn Tyr Glu Leu Pro Leu Lys Asn Glu Ile Pro Cys Ile Asn
130 135 140

Cys Gly Gln Cys Ile His Trp Cys Pro Ser Gly Ala Ile Ser Glu Arg
145 150 155 160

Glu Asp Ile Asp Gln Val Ala Lys Ala Leu Ala Asp Pro Lys Ile Thr
165 170 175

Val Val Val Gln Thr Ala Pro Ala Thr Arg Ile Gly Leu Gly Glu Glu
180 185 190

Phe Gly Leu Pro Val Gly Thr Asn Val Gln Gly Lys Gln Val Ala Ala
195 200 205

Leu Arg Lys Leu Gly Phe Asp Val Ile Phe Asp Thr Asn Phe Ala Ala
210 215 220

Asp Leu Thr Ile Met Glu Glu Gly Thr Glu Leu Val Lys Arg Ile Thr
225 230 235 240

Gly Glu Leu His His Pro Leu Pro Gln Phe Thr Ser Cys Cys Pro Gly
245 250 255

Trp Val Lys Phe Val Glu Tyr Tyr Tyr Pro Glu Leu Leu Pro Asn Leu
260 265 270

Ser Ser Ala Lys Ser Pro Gln Gln Met Ala Gly Ala Leu Val Lys Thr

275

280

285

Tyr Phe Ala Glu Lys Asn His Val Glu Pro Gln Lys Ile Phe Ser Val
 290 295 300
 Ala Ile Met Pro Cys Thr Ala Lys Lys Phe Glu Cys Gln Arg Pro Glu
 305 310 315 320
 Met Ile Ser Ala Gln Thr Tyr Trp Gln Asp Glu Gln Val Ser Pro Asp
 325 330 335
 Val Asp Val Val Leu Thr Thr Arg Glu Leu Ala Arg Met Ile Lys Arg
 340 345 350
 Ala Gly Ile Asp Leu Pro Ser Leu Pro Asp Glu Glu Tyr Asp Gln Leu
 355 360 365
 Met Gly Val Ala Thr Gly Ala Gly Ala Ile Phe Gly Thr Thr Gly Gly
 370 375 380
 Val Met Glu Ala Ala Val Arg Ser Ala Tyr Tyr Leu Val Thr Gly Glu
 385 390 395 400
 Gln Pro Pro Ala Ala Leu Trp Gln Leu Thr Pro Val Arg Gly Met Glu
 405 410 415
 Gly Val Lys Glu Ala Ala Val Ser Ile Pro Gly Ala Gly Glu Ile Arg
 420 425 430
 Ile Ala Val Ile Ser Gly Leu Asp Asn Ala Arg Ala Ile Met Glu Gln
 435 440 445
 Val Lys Ala Gly Asn Ser Pro Trp Thr Phe Ile Glu Val Met Ala Cys
 450 455 460
 Pro Gly Gly Cys Gln Tyr Gly Gly Gly Gln Pro Arg Ser Ser Ala Pro
 465 470 475 480
 Pro Ser Asp Gly Val Arg Asn Thr Arg Ala Ala Ser Leu Tyr Lys Ile
 485 490 495
 Asp Ala Gln Ala Lys Leu Arg Asn Ser His Asp Asn Pro Gln Ile Lys
 500 505 510
 Gln Val Tyr Ala Glu Phe Leu Thr Ser Pro Leu Ser Glu Lys Ala Glu
 515 520 525
 Glu Leu Leu His Thr His Tyr Ile Ser Arg Ala Glu Glu Phe Asp Ala
 530 535 540
 Lys Lys Pro Gln Ser His Glu Tyr Glu Val
 545 550

060513 second sequence listing formatted.txt

<210> 34
 <211> 578
 <212> PRT
 <213> Eubacterium acidaminophilum

<400> 34

Met Val Asn Ile Thr Ile Asp Gly Arg Gln Val Thr Val Pro Ala Asn
 1 5 10 15

Ser Thr Val Leu Asp Ala Ala Arg Asp Met Gly Ile Asn Ile Pro Thr
 20 25 30

Leu Cys Tyr Leu Lys Asp Ile Asn Lys Thr Gly Ala Cys Arg Met Cys
 35 40 45

Leu Val Glu Val Glu Gly Ile Arg Asn Leu Gln Thr Ala Cys Thr Phe
 50 55 60

Pro Val Arg Asp Gly Leu Val Val Lys Thr Asn Thr Lys Arg Val Arg
 65 70 75 80

Asp Ala Arg Arg Asp Asn Leu Gln Leu Ile Leu Ser Asn His His Arg
 85 90 95

Asp Cys Leu Ser Cys Phe Arg Asn Gly Ser Cys Glu Leu Gln Ala Leu
 100 105 110

Cys Asp Asp Met Gly Leu Ser Glu Leu Asp Phe Glu Ala Pro Lys Glu
 115 120 125

Leu Lys Pro Val Asp Met Leu Ser His Ser Ile Val Arg Asp Pro Asn
 130 135 140

Lys Cys Ile Leu Cys Gly Arg Cys Val Ala Val Cys Asn Lys Val Gln
 145 150 155 160

Glu Val Gly Ile Leu Ala Phe Thr Asn Arg Gly Val Glu Thr Glu Val
 165 170 175

Ala Pro Ala Phe Ala Thr Ser Met Ala Asp Ala Pro Cys Ile Tyr Cys
 180 185 190

Gly Gln Cys Val Asn Val Cys Pro Val Ala Ala Leu Arg Glu Lys Thr
 195 200 205

Asp Ile Glu Lys Val Trp Glu Val Leu Glu Asp Glu Thr Lys His Val
 210 215 220

Val Val Gln Val Ala Pro Ala Val Arg Ala Ala Leu Gly Glu Met Phe
 225 230 235 240

Gly Asn Pro Ile Gly Thr Arg Val Thr Gly Lys Met Phe Thr Ala Leu
 245 250 255

060513 second sequence listing formatted.txt

Lys Met Leu Gly Phe Gln Lys Val Phe Asp Thr Asn Phe Ala Ala Asp
 260 265 270
 Leu Thr Ile Met Glu Glu Gly Thr Glu Leu Leu Gly Arg Ile Lys Asn
 275 280 285
 Gly Gly Thr Leu Pro Met Ile Thr Ser Cys Ser Pro Gly Trp Ile Arg
 290 295 300
 Tyr Val Glu His Phe Tyr Pro Glu Leu Leu Asp His Val Ser Ser Cys
 305 310 315 320
 Lys Ser Pro Gln Gln Met Met Gly Ala Val Leu Lys Ser Tyr Tyr Ala
 325 330 335
 Glu Lys Asn Asn Ile Ala Pro Glu Asn Met Ile Val Val Ser Val Met
 340 345 350
 Pro Cys Ile Ala Lys Lys Thr Glu Ser Ala Lys Glu Glu Met Lys Asn
 355 360 365
 Val His Gly Thr Arg Asp Val Asp Ile Val Leu Thr Thr Arg Glu Leu
 370 375 380
 Gly Lys Met Ile Lys Glu Ala Arg Ile Glu Phe Asn Asp Leu Gln Asp
 385 390 395 400
 Ser Asn Pro Asp Glu Phe Phe Gly Asp Tyr Thr Gly Ala Ala Val Ile
 405 410 415
 Phe Gly Ala Thr Gly Gly Val Met Glu Ala Ala Ile Arg Thr Val Ala
 420 425 430
 Asp Ile Val Ser Gly Gln Glu Leu Glu Asp Ile Glu Tyr Thr Ala Val
 435 440 445
 Arg Gly Leu Glu Gly Ile Lys Glu Ala Ala Val Lys Ile Gly Asp Leu
 450 455 460
 Glu Val Lys Val Ala Val Ala His Gly Thr Ala Asn Ala Gly Lys Leu
 465 470 475 480
 Met Asp Leu Val Arg Asp Gly Lys Ala Asp Tyr His Phe Ile Glu Ile
 485 490 495
 Met Gly Cys Ser Gly Gly Cys Val Thr Gly Gly Gly Gln Pro His Val
 500 505 510
 Asp Ser Arg Thr Lys Glu Lys Val Asn Val Lys Leu Glu Arg Ala Lys
 515 520 525

Ala Leu Tyr Thr Glu Asp Lys Leu Arg Asp Lys Arg Lys Ser His His
 530 535 540

Asn Glu Ser Val Lys Arg Leu Tyr Glu Glu Tyr Leu Gly Lys Pro Asn
 545 550 555 560

Gly His Lys Ala His Glu Leu Leu His Thr His Tyr Lys Lys Arg Glu
 565 570 575

Leu Phe

<210> 35

<211> 619

<212> PRT

<213> Rhodopseudomonas palustris

<400> 35

Met Cys Thr Pro Asp Gln Ala Ser Leu Ser Ala Arg Asp Pro Ala Glu
 1 5 10 15

Ala Thr Ile Thr Leu Ser Ile Asn Gly Val Ala Cys Ala Gly Phe Ala
 20 25 30

Asn Glu Thr Ile Leu Ser Cys Ala Arg Arg Tyr Asp Val Tyr Ile Pro
 35 40 45

Thr Leu Cys Glu Leu Glu Asp Ile Asp His Thr Pro Gly Ala Cys Arg
 50 55 60

Val Cys Leu Val Glu Ile Leu Gln Ala Gly Lys Asp Thr Pro Gln Ile
 65 70 75 80

Val Thr Ala Cys Asn Thr Pro Val Arg Asp Gly Met Glu Val Gln Thr
 85 90 95

Arg Ser Lys Lys Ala Arg Asp Met Gln Arg Leu Gln Val Glu Leu Leu
 100 105 110

Met Ala Asp His Leu Gln Asp Cys Ala Thr Cys Ile Arg His Gly Ser
 115 120 125

Cys Glu Leu Gln Asp Leu Ala Gln Phe Val Gly Leu Gln Gln Asn Arg
 130 135 140

Phe Phe Asp Arg Glu Arg Thr Glu Ala Arg Pro Val Asp His Ser Ser
 145 150 155 160

Pro Ser Met Val Arg Asp Met Arg Arg Cys Val Arg Cys Gln Arg Cys
 165 170 175

Val Ala Ile Cys Arg Tyr His Gln Lys Ile Asp Ala Leu Ala Ile Glu
 180 185 190

060513 second sequence listing formatted.txt

Gly Ser Gly Leu Glu Arg Met Val Ala Leu Arg Asp Ala Asp Gly Tyr
195 200 205

Pro Asn Ser Val Cys Val Ser Cys Gly Gln Cys Val Leu Val Cys Pro
210 215 220

Thr Gly Ala Leu Gly Glu Arg Asp Glu Thr Asp Arg Ala Leu Asp Tyr
225 230 235 240

Ile Cys Asp Pro Asn Val Val Thr Val Val Gln Phe Ala Pro Ala Val
245 250 255

Arg Val Ala Phe Gly Glu Glu Phe Gly Leu Pro Ala Gly Thr Asn Val
260 265 270

Glu Gly Gln Ile Ile Ala Ala Cys Arg Lys Leu Gly Val Asp Val Val
275 280 285

Leu Asp Thr Asn Phe Ala Ala Asp Val Val Ile Met Glu Glu Gly Ala
290 295 300

Glu Leu Leu Ala Arg Leu Lys Gln Gly Arg Arg Pro Thr Phe Thr Ser
305 310 315 320

Cys Cys Pro Ala Trp Ile Asn Phe Ala Glu Ile His Tyr Pro Asp Val
325 330 335

Leu Pro Leu Leu Ser Ser Thr Lys Ser Pro Gln Gln Val Leu Ser Thr
340 345 350

Ile Ala Lys Ser Tyr Leu Pro Ala Gln Leu Gly Val Pro Ala Glu Arg
355 360 365

Ile Arg Val Ile Ser Ile Met Pro Cys Ile Ala Lys Lys Asp Glu Ala
370 375 380

Val Arg Pro Gln Met Val His Asp Gly Gln Pro Glu Thr Asp Leu Val
385 390 395 400

Leu Thr Thr Arg Glu Phe Ala Arg Leu Leu Arg Arg Glu Gly Ile Asp
405 410 415

Leu Lys Asp Leu Pro Ser Ser Gln Phe Asp Arg Pro Phe Leu Ser Ala
420 425 430

Tyr Ser Gly Ala Gly Ala Ile Phe Gly Thr Thr Gly Gly Val Met Glu
435 440 445

Ala Ala Val Arg Thr Ile Tyr Ala Leu Val Asn Gly Arg Glu Leu Glu
450 455 460

Arg Ile Glu Leu Thr Gln Leu Arg Gly Phe Glu Gly Leu Arg Glu Ala

465 470 475 480
 Thr Val Asp Leu Gly Ala Pro Val Gly Glu Val Lys Val Ala Met Val
 485 490 495
 His Gly Leu Gly Asp Thr Arg Lys Leu Val Glu Ser Val Leu Ser Gly
 500 505 510
 Glu Ala Asn Tyr Asp Phe Ile Glu Val Met Ala Cys Pro Gly Gly Cys
 515 520 525
 Val Asp Gly Gly Gly Ser Leu Arg Ser Lys Lys Ala Tyr Leu Pro Leu
 530 535 540
 Ala Leu Lys Arg Arg Glu Thr Ile Tyr Asn Val Asp Arg Ala Ala Lys
 545 550 555 560
 Val Arg Gln Ser His Asn Asn Pro Gln Val Gln Ala Leu Tyr Arg Glu
 565 570 575
 Leu Leu Gln Ala Pro Asn Ser Glu Ile Ala His Arg Leu Leu His Thr
 580 585 590
 His Tyr Ala Ser Arg Lys Arg Glu Leu Gln His Thr Val Lys Glu Ile
 595 600 605
 Trp Asp Asp Leu Thr Met Ser Thr Ile Leu Tyr
 610 615
 <210> 36
 <211> 644
 <212> PRT
 <213> Clostridium thermocellum
 <400> 36
 Met Asp Ser Phe Leu Met Lys Gly Tyr Ile Lys Glu Ala Asn Ile Asp
 1 5 10 15
 Tyr Ser Cys Ser Arg Gly Ser Met Glu Asp Leu Pro Lys Trp Glu Phe
 20 25 30
 Arg Glu Ile Pro Lys Val Pro Arg Ala Val Met Pro Ser Leu Ser Leu
 35 40 45
 Glu Glu Arg Lys Asn Asn Phe Asn Glu Val Glu Leu Gly Leu Ser Glu
 50 55 60
 Glu Val Ala Arg Lys Glu Ala Arg Arg Cys Leu Lys Cys Gly Cys Ser
 65 70 75 80
 Ala Arg Phe Thr Cys Asp Leu Arg Lys Glu Ala Ser Asn His Gly Ile
 85 90 95

Val Tyr Glu Glu Pro Ile His Asp Arg Pro Tyr Ile Pro Lys Val Asp
 100 105 110

Asp His Pro Phe Ile Val Arg Asp His Asn Lys Cys Ile Ser Cys Gly
 115 120 125

Arg Cys Ile Ala Ala Cys Ala Glu Ile Glu Gly Pro Gly Val Leu Thr
 130 135 140

Phe Tyr Met Lys Asn Gly Arg Gln Leu Val Gly Thr Lys Ser Gly Leu
 145 150 155 160

Pro Leu Arg Asp Thr Asp Cys Val Ser Cys Gly Gln Cys Val Thr Ala
 165 170 175

Cys Pro Cys Ala Ala Leu Asp Tyr Arg Arg Glu Arg Gly Lys Val Val
 180 185 190

Arg Ala Ile Asn Asp Pro Lys Lys Thr Val Val Gly Phe Val Ala Pro
 195 200 205

Ala Val Arg Ser Leu Ile Ser Asn Thr Phe Gly Val Ser Tyr Glu Glu
 210 215 220

Ala Ser Pro Phe Met Ala Gly Leu Leu Lys Lys Leu Gly Phe Asp Lys
 225 230 235 240

Val Phe Asp Phe Thr Phe Ala Ala Asp Leu Thr Ile Val Glu Glu Thr
 245 250 255

Thr Glu Phe Leu Ser Arg Ile Gln Asn Lys Gly Val Met Pro Gln Phe
 260 265 270

Thr Ser Cys Cys Pro Gly Trp Ile Asn Phe Val Glu Lys Arg Tyr Pro
 275 280 285

Glu Ile Ile Pro His Leu Ser Thr Cys Lys Ser Pro Gln Met Met Met
 290 295 300

Gly Ala Thr Val Lys Asn His Tyr Ala Lys Leu Met Gly Ile Asn Lys
 305 310 315 320

Glu Asp Leu Phe Val Val Ser Ile Val Pro Cys Leu Ala Lys Lys Tyr
 325 330 335

Glu Ala Ala Arg Pro Glu Phe Ile His Asp Gly Ile Arg Asp Val Asp
 340 345 350

Ala Val Leu Thr Thr Thr Glu Met Leu Glu Met Met Glu Leu Ala Asp
 355 360 365

Ile Lys Pro Ser Glu Val Val Pro Gln Glu Phe Asp Glu Pro Tyr Lys
 370 375 380

Gln Val Ser Gly Ala Gly Ile Leu Phe Gly Ala Ser Gly Gly Val Ala
 385 390 395 400
 Glu Ala Ala Leu Arg Met Ala Val Glu Lys Leu Thr Gly Lys Val Leu
 405 410 415
 Thr Asp His Leu Glu Phe Glu Glu Ile Arg Gly Phe Glu Gly Val Lys
 420 425 430
 Glu Ser Thr Ile Asp Val Asn Gly Thr Lys Val Arg Val Ala Val Val
 435 440 445
 Ser Gly Leu Lys Asn Ala Glu Pro Ile Ile Glu Lys Ile Leu Asn Gly
 450 455 460
 Val Asp Val Gly Tyr Asp Leu Ile Glu Val Met Ala Cys Pro Gly Gly
 465 470 475 480
 Cys Ile Cys Gly Ala Gly His Pro Val Pro Glu Lys Ile Asp Ser Leu
 485 490 495
 Glu Lys Arg Gln Gln Val Leu Val Asn Ile Asp Lys Val Ser Lys Tyr
 500 505 510
 Arg Lys Ser Gln Glu Asn Pro Asp Ile Leu Arg Leu Tyr Asn Glu Phe
 515 520 525
 Tyr Gly Glu Pro Asn Ser Pro Leu Ala His Glu Leu Leu His Thr His
 530 535 540
 Tyr Thr Pro Lys His Gly Asp Ser Thr Cys Ser Pro Glu Arg Lys Lys
 545 550 555 560
 Gly Thr Ala Ala Phe Asp Val Gln Glu Phe Thr Ile Cys Met Cys Glu
 565 570 575
 Ser Cys Met Glu Lys Gly Ala Glu Asn Leu Tyr Asn Asp Leu Ser Ser
 580 585 590
 Lys Ile Arg Leu Phe Lys Met Asp Pro Phe Val Gln Ile Lys Arg Ile
 595 600 605
 Arg Leu Lys Glu Thr His Pro Gly Lys Gly Val Tyr Ile Ala Leu Asn
 610 615 620
 Gly Lys Gln Ile Glu Glu Pro Met Leu Ser Gly Asn Ile Pro Asp Glu
 625 630 635 640
 Ser Glu Ser Glu

<210> 37
 <211> 572
 <212> PRT
 <213> Clostridium perfringens

<400> 37

Met Asn Lys Ile Ile Ile Asn Asp Lys Thr Ile Glu Phe Asp Gly Asp
 1 5 10 15

Lys Thr Ile Leu Asp Leu Ala Arg Glu Asn Gly Phe Asp Ile Pro Val
 20 25 30

Leu Cys Glu Leu Lys Asn Cys Gly Asn Lys Gly Gln Cys Gly Val Cys
 35 40 45

Leu Val Glu Gln Glu Gly Asn Asp Arg Leu Leu Arg Ser Cys Ala Ile
 50 55 60

Lys Ala Lys Asp Gly Met Val Ile Lys Thr Asp Ser Glu Lys Val Leu
 65 70 75 80

Glu Ala Arg Lys Glu Arg Val Ala Glu Leu Leu Asp Glu His Glu Phe
 85 90 95

Lys Cys Gly Pro Cys Lys Arg Arg Glu Asn Cys Glu Phe Leu Lys Leu
 100 105 110

Val Ile Lys Thr Lys Ala Arg Ala His Lys Pro Phe Val Val Ala Asp
 115 120 125

Lys Ser Glu Tyr Val Asp Asp Arg Ser Lys Ser Ile Val Leu Asp Arg
 130 135 140

Ser Lys Cys Val Lys Cys Gly Arg Cys Val Ala Ala Cys Arg Thr Arg
 145 150 155 160

Thr Ala Thr Asn Ser Ile Lys Phe His Arg Ile Asp Gly Val Arg Leu
 165 170 175

Val Gly Pro Glu Glu Leu Lys Cys Phe Asp Asp Thr Asn Cys Leu Leu
 180 185 190

Cys Gly Gln Cys Ile Ala Ala Cys Pro Val Asp Ala Leu Ser Glu Lys
 195 200 205

Ser His Ile Glu Arg Val Gln Glu Ala Leu Asn Asp Pro Glu Lys His
 210 215 220

Val Ile Val Ala Met Ala Pro Ala Val Arg Thr Ser Met Gly Glu Leu
 225 230 235 240

Phe Lys Met Gly Tyr Gly Gln Asp Val Thr Gly Lys Leu Tyr Thr Ala
 245 250 255

060513 second sequence listing formatted.txt

Leu Arg Glu Leu Gly Phe Asp Lys Val Phe Asp Ile Asn Phe Gly Ala
 260 265 270
 Asp Met Thr Ile Met Glu Glu Ala Thr Glu Leu Ile Glu Arg Ile Lys
 275 280 285
 Asn Asn Gly Pro Phe Pro Met Leu Thr Ser Cys Cys Pro Ser Trp Val
 290 295 300
 Arg Glu Val Glu Asn Tyr Phe Pro Glu Leu Val Glu Asn Leu Ser Ser
 305 310 315 320
 Ala Lys Ser Pro Gln Gln Ile Phe Gly Ala Ala Ser Lys Thr Tyr Tyr
 325 330 335
 Pro Gln Val Ala Asp Ile Asp Pro Lys Lys Val Phe Thr Val Thr Val
 340 345 350
 Met Pro Cys Thr Ser Lys Lys Phe Glu Ala Asp Arg Pro Glu Met Glu
 355 360 365
 Asn Glu Gly Ile Arg Asn Ile Asp Ala Val Ile Thr Thr Arg Glu Leu
 370 375 380
 Ala Arg Met Ile Lys Ala Ala Lys Ile Asp Phe Ala Lys Leu Glu Asp
 385 390 395 400
 Gly Glu Val Asp Pro Ala Met Gly Glu Tyr Thr Gly Ala Gly Val Ile
 405 410 415
 Phe Gly Ala Thr Gly Gly Val Met Glu Ala Ala Leu Arg Thr Ala Lys
 420 425 430
 Asp Phe Met Glu Asn Asp Asn Leu Asp Asn Val Asp Tyr Glu Ala Val
 435 440 445
 Arg Gly Leu Ala Gly Ile Lys Glu Ala Glu Val Glu Ile Ala Gly Asn
 450 455 460
 Glu Tyr Lys Leu Ala Val Val Ser Gly Ala Ala Asn Val Phe Glu Leu
 465 470 475 480
 Val Lys Ser Gly Lys Ile Asn Asp Tyr His Phe Ile Glu Val Met Ala
 485 490 495
 Cys Pro Gly Gly Cys Val Asn Gly Gly Gly Gln Pro His Ile Ser Ala
 500 505 510
 Glu Asp Ser Asp Lys Met Asp Ile Arg Glu Val Arg Ala Ser Val Leu
 515 520 525
 Tyr Asn Gln Asp Lys Asn Leu Glu Lys Arg Lys Ser His Gln Asn Ser

530

535

540

Ala Leu Leu Lys Met Tyr Glu Ser Tyr Met Gly Lys Pro Gly His Gly
 545 550 555 560

Arg Ala His Glu Leu Leu His Met Lys Tyr Lys Lys
 565 570

<210> 38

<211> 583

<212> PRT

<213> Clostridium thermocellum

<400> 38

Met His Val Leu Lys Leu Val His Ser Thr Gln Tyr Trp Arg Ala Glu
 1 5 10 15

Glu Met Asp Asn Arg Glu Tyr Met Leu Ile Asp Gly Ile Pro Val Glu
 20 25 30

Ile Asn Gly Glu Lys Asn Leu Leu Glu Leu Ile Arg Lys Ala Gly Ile
 35 40 45

Lys Leu Pro Thr Phe Cys Tyr His Ser Glu Leu Ser Val Tyr Gly Ala
 50 55 60

Cys Arg Met Cys Met Val Glu Asn Glu Trp Gly Gly Leu Asp Ala Ala
 65 70 75 80

Cys Ser Thr Pro Pro Arg Ala Gly Met Ser Ile Lys Thr Asn Thr Glu
 85 90 95

Arg Leu Gln Lys Tyr Arg Lys Met Ile Leu Glu Leu Leu Leu Ala Asn
 100 105 110

His Cys Arg Asp Cys Thr Thr Cys Asn Asn Asn Gly Lys Cys Lys Leu
 115 120 125

Gln Asp Leu Ala Met Arg Tyr Asn Ile Ser His Ile Arg Phe Pro Asn
 130 135 140

Thr Ala Ser Asn Pro Asp Val Asp Asp Ser Ser Leu Cys Ile Thr Arg
 145 150 155 160

Asp Arg Ser Lys Cys Ile Leu Cys Gly Asp Cys Val Arg Val Cys Asn
 165 170 175

Glu Val Gln Asn Val Gly Ala Ile Asp Phe Ala Tyr Arg Gly Ser Lys
 180 185 190

Met Thr Ile Ser Thr Val Phe Asp Lys Pro Ile Phe Glu Ser Asn Cys
 195 200 205

Val Gly Cys Gly Gln Cys Ala Leu Ala Cys Pro Thr Gly Ala Ile Val
 210 215 220

Val Lys Asp Asp Thr Gln Lys Val Trp Lys Glu Ile Tyr Asp Lys Asn
 225 230 235 240

Thr Arg Val Ser Val Gln Ile Ala Pro Ala Val Arg Val Ala Leu Gly
 245 250 255

Lys Glu Leu Gly Leu Asn Asp Gly Glu Asn Ala Ile Gly Lys Ile Val
 260 265 270

Ala Ala Leu Arg Arg Met Gly Phe Asp Asp Ile Phe Asp Thr Ser Thr
 275 280 285

Gly Ala Asp Leu Thr Val Leu Glu Glu Ser Ala Glu Leu Leu Arg Arg
 290 295 300

Ile Arg Glu Gly Lys Asn Asp Met Pro Leu Phe Thr Ser Cys Cys Pro
 305 310 315 320

Ala Trp Val Asn Tyr Cys Glu Lys Phe Tyr Pro Glu Leu Leu Pro His
 325 330 335

Val Ser Thr Cys Arg Ser Pro Met Gln Met Phe Ala Ser Ile Ile Lys
 340 345 350

Glu Glu Tyr Ser Thr Ser Ser Lys Arg Leu Val His Val Ala Val Met
 355 360 365

Pro Cys Thr Ala Lys Lys Phe Glu Ala Ala Arg Lys Glu Phe Lys Val
 370 375 380

Asn Gly Val Pro Asn Val Asp Tyr Val Leu Thr Thr Gln Glu Leu Val
 385 390 395 400

Arg Met Ile Lys Glu Ser Gly Ile Val Phe Ser Glu Leu Glu Pro Glu
 405 410 415

Ala Ile Asp Met Pro Phe Gly Thr Tyr Thr Gly Ala Gly Val Ile Phe
 420 425 430

Gly Val Ser Gly Gly Val Thr Glu Ala Val Leu Arg Arg Val Val Ser
 435 440 445

Asp Lys Ser Pro Thr Ser Phe Arg Ser Leu Ala Tyr Thr Gly Val Arg
 450 455 460

Gly Met Asn Gly Val Lys Glu Ala Ser Val Met Tyr Gly Asp Arg Lys
 465 470 475 480

Leu Lys Val Ala Val Val Ser Gly Leu Lys Asn Ala Gly Asp Leu Ile
 485 490 495

Glu Arg Ile Lys Ala Gly Glu His Tyr Asp Leu Val Glu Val Met Ala
 500 505 510

Cys Pro Gly Gly Cys Ile Asn Gly Gly Gly Gln Pro Phe Val Gln Ser
 515 520 525

Glu Glu Arg Glu Lys Arg Gly Lys Gly Leu Tyr Ser Ala Asp Lys Leu
 530 535 540

Cys Asn Ile Lys Ser Ser Glu Glu Asn Pro Leu Met Met Thr Leu Tyr
 545 550 555 560

Lys Gly Ile Leu Lys Gly Arg Val His Glu Leu Leu His Val Asp Tyr
 565 570 575

Ala Ser Lys Lys Glu Ala Lys
 580

<210> 39
 <211> 439
 <212> PRT
 <213> Desulfovibrio desulfuricans

<400> 39

Met Ala Gly Cys Lys Ala Gln His Pro Pro Ala Ala Tyr Leu Ala Gly
 1 5 10 15

Leu Glu Val Pro Ala Ala Gly Ser Glu Val Thr Met Glu Gly Val Arg
 20 25 30

Tyr Lys Met Asn Ala Pro Lys Asp Val Asp Pro Ala Thr Ile Arg Phe
 35 40 45

Val Glu Val Asp His Asp Lys Cys Met Ala Cys Gly Glu Cys Glu Tyr
 50 55 60

His Cys Pro Thr Gly Val Met Gln Glu Val Thr Glu Asp Gly Tyr Arg
 65 70 75 80

Gly Val Val Asp Pro Val Ala Cys Val Asn Cys Gly Gln Cys Leu Ala
 85 90 95

Asn Cys Pro Phe Gly Ala Ile His Glu Glu Val Ser Phe Val Gly Glu
 100 105 110

Leu Tyr Glu Lys Leu Lys Asp Pro Asp Thr Val Val Val Ser Met Pro
 115 120 125

Ala Pro Ala Val Arg Tyr Ala Leu Gly Glu Cys Phe Gly Leu Pro Thr
 130 135 140

Gly Thr Tyr Val Gly Gly Gln Met His Ala Ala Leu Arg Arg Leu Gly

Phe Thr Arg Arg Ser Val Ala
435

<210> 40
<211> 379
<212> PRT
<213> Desulfovibrio desulfuricans
<400> 40

Met Asn Leu Val Glu Met Glu Lys Ile Gln Tyr Val Asp Gln Ser Pro
1 5 10 15

Asp Pro Arg Ala Asn Pro Asp Glu Leu Phe Phe Ile Gln Ile Asp Pro
20 25 30

Glu Lys Cys Ile Gly Cys Asp Thr Cys Gln Glu Tyr Cys Pro Thr Gly
35 40 45

Ala Ile Phe Gly Asp Thr Gly Ser Ala His Ser Ile Pro His Glu Glu
50 55 60

Ile Cys Ile Asn Cys Gly Gln Cys Leu Thr His Cys Pro Val Gly Ala
65 70 75 80

Ile Tyr Glu Val Gln Ser Trp Val Arg Glu Leu Ser Glu Lys Ile Lys
85 90 95

Asp Pro Glu Ile Lys Val Ile Ala Met Pro Ala Pro Ala Val Arg Tyr
100 105 110

Gly Leu Gly Glu Cys Phe Gly Met Pro Val Gly Thr Val Thr Thr Gly
115 120 125

Lys Met Leu Thr Ala Leu Gln Met Leu Gly Phe Asp His Val Trp Asp
130 135 140

Asn Glu Phe Thr Ala Asp Val Thr Ile Trp Glu Glu Gly Thr Glu Phe
145 150 155 160

Val Lys Arg Leu Thr Gly Gln Ile Asp Lys Pro Leu Pro Gln Phe Thr
165 170 175

Ser Cys Cys Pro Gly Trp His Lys Tyr Val Glu Ser Phe Tyr Pro Glu
180 185 190

Leu Phe Pro His Leu Ser Ser Cys Lys Ser Pro Ile Gly Met Met Gly
195 200 205

Ala Leu Ala Lys Thr Tyr Gly Pro Asp Val Met Lys Tyr Asp Arg Ser
210 215 220

Lys Val Tyr Thr Val Ser Ile Met Pro Cys Thr Ala Lys Lys Tyr Glu
225 230 235 240

060513 second sequence listing formatted.txt

Gly Met Arg Ala Asp₂₄₅ Leu Trp Ser Ser Gly₂₅₀ Tyr Lys Asp Ile Asp₂₅₅ Ala

Thr Ile Asp Thr₂₆₀ Arg Glu Leu Ala Tyr₂₆₅ Met Ile Lys Lys Ala₂₇₀ Gly Ile

Asp Phe Ala₂₇₅ Ala Leu Pro Asp Gly₂₈₀ Lys Arg Asp Thr Leu₂₈₅ Met Gly Asp

Ser Thr₂₉₀ Gly Gly Ala Thr Ile₂₉₅ Phe Gly Val Ser Gly₃₀₀ Gly Val Met Glu

Ala₃₀₅ Ala Leu Arg Tyr Ala₃₁₀ Tyr Glu Ala Val Thr₃₁₅ Gly Lys Lys Pro Ser₃₂₀

Ser Trp Asp Phe Thr₃₂₅ Met Val Arg Gly Leu₃₃₀ Asn Gly Ile Lys Glu₃₃₅ Gly

Thr Val Thr Ile₃₄₀ Gly Asp Ala Lys Ile₃₄₅ Asn Val Ala Val Val₃₅₀ His Gly

Ala Lys Arg₃₅₅ Phe Ala Glu Val Cys₃₆₀ Glu Val Ile Lys Thr₃₆₅ Gly Lys Ser

Pro Cys₃₇₀ Ile Ser Ser Ser Leu₃₇₅ Cys Leu Pro Arg

<210> 41
<211> 421
<212> PRT
<213> Desulfovibrio desulfuricans

<400> 41

Met Asn Leu Val₅ Glu Met Glu Lys Ile Gln Tyr Val Asp Gln Ser Pro₁₅

Asp Pro Arg Ala₂₀ Asn Pro Asp Glu₂₅ Leu Phe Phe Ile Gln Ile₃₀ Asp Pro

Glu Lys Cys₃₅ Ile Gly Cys Asp Thr₄₀ Cys Gln Glu Tyr Cys₄₅ Pro Thr Gly

Ala Ile Phe Gly Asp Thr Gly₅₅ Ser Ala His Ser Ile₆₀ Pro His Glu Glu

Ile Cys Ile Asn Cys Gly₇₀ Gln Cys Leu Thr His₇₅ Cys Pro Val Gly Ala₈₀

Ile Tyr Glu Val₈₅ Gln Ser Trp Val Arg Glu₉₀ Leu Ser Glu Lys Ile₉₅ Lys

Asp Pro Glu Ile Lys Val Ile Ala Met Pro Ala Pro Ala Val Arg Tyr

100

105

110

Gly Leu Gly Glu Cys Phe Gly Met Pro Val Gly Thr Val Thr Thr Gly
 115 120 125

Lys Met Leu Thr Ala Leu Gln Met Leu Gly Phe Asp His Val Trp Asp
 130 135 140

Asn Glu Phe Thr Ala Asp Val Thr Ile Trp Glu Glu Gly Thr Glu Phe
 145 150 155 160

Val Lys Arg Leu Thr Gly Gln Ile Asp Lys Pro Leu Pro Gln Phe Thr
 165 170 175

Ser Cys Cys Pro Gly Trp His Lys Tyr Val Glu Ser Phe Tyr Pro Glu
 180 185 190

Leu Phe Pro His Leu Ser Ser Cys Lys Ser Pro Ile Gly Met Met Gly
 195 200 205

Ala Leu Ala Lys Thr Tyr Gly Pro Asp Val Met Lys Tyr Asp Arg Ser
 210 215 220

Lys Val Tyr Thr Val Ser Ile Met Pro Cys Thr Ala Lys Lys Tyr Glu
 225 230 235 240

Gly Met Arg Ala Asp Leu Trp Ser Ser Gly Tyr Lys Asp Ile Asp Ala
 245 250 255

Thr Ile Asp Thr Arg Glu Leu Ala Tyr Met Ile Lys Lys Ala Gly Ile
 260 265 270

Asp Phe Ala Ala Leu Pro Asp Gly Lys Arg Asp Thr Leu Met Gly Asp
 275 280 285

Ser Thr Gly Gly Ala Thr Ile Phe Gly Val Ser Gly Gly Val Met Glu
 290 295 300

Ala Ala Leu Arg Tyr Ala Tyr Glu Ala Val Thr Gly Lys Lys Pro Ser
 305 310 315 320

Ser Trp Asp Phe Thr Met Val Arg Gly Leu Asn Gly Ile Lys Glu Gly
 325 330 335

Thr Val Thr Ile Gly Asp Ala Lys Ile Asn Val Ala Val Val His Gly
 340 345 350

Ala Lys Arg Phe Ala Glu Val Cys Glu Val Ile Lys Thr Gly Lys Ser
 355 360 365

Pro Trp His Phe Ile Glu Phe Met Ala Cys Pro Gly Gly Cys Val Cys
 370 375 380

060513 second sequence listing formatted.txt

Gly Gly Gly Gln Pro Val Met Pro Gly Val Leu Glu Ala Met Asp Arg
385 390 395 400

Lys Val Ser Arg Thr Phe Ala Gly Leu Lys Glu Arg Leu Asn Arg Met
405 410 415

Ser Ser Ser Lys Ala
420

<210> 42
<211> 369
<212> PRT
<213> Trichomonas vaginalis

<400> 42

Cys Asp Gly Lys Trp Leu Ser Pro Ala Cys Val Thr Thr Val Trp Asp
1 5 10 15

Gly Leu Lys Ile Asp Thr Lys Ser Lys Asn Val Arg Asp Ser Val Glu
20 25 30

Asn Asn Leu Lys Glu Leu Leu Asp Cys His Asp Glu Thr Cys Ser Ala
35 40 45

Cys Ile Ala Asn His Arg Cys Gln Phe Arg Asp Met Asn Val Ala Tyr
50 55 60

Ser Val Lys Ala Glu Thr Lys Glu Ile Cys Ser Glu Glu Gly Ile Asp
65 70 75 80

Glu Ser Thr Asn Ala Ile Arg Leu Asp Thr Ser Lys Cys Val Leu Cys
85 90 95

Gly Arg Cys Ile Arg Ala Cys Glu Glu Val Ala Gly Thr Ser Ala Ile
100 105 110

Ile Phe Gly Asn Arg Ala Lys Lys Met Arg Ile Gln Pro Thr Phe Gly
115 120 125

Val Thr Leu Gln Glu Thr Ser Cys Ile Lys Cys Gly Gln Cys Thr Leu
130 135 140

Tyr Cys Pro Val Gly Ala Ile Thr Glu Lys Ser Gln Val Lys Glu Ala
145 150 155 160

Leu Asp Ile Leu Ala Asn Lys Gly Lys Lys Ile Thr Val Val Gln Val
165 170 175

Ala Pro Ala Val Arg Val Ala Leu Ser Glu Ala Phe Gly Tyr Lys Glu
180 185 190

Gly Thr Val Thr Thr Gly Lys Met Val Ser Ala Leu Lys Ala Leu Gly
195 200 205

060513 second sequence listing formatted.txt

Phe Asp Leu Val Tyr Asp Thr Asn Tyr Gly Ala Asp Leu Thr Ile Cys
210 215 220

Glu Glu Ala Gly Glu Leu Val Asn Arg Leu Arg Asp Pro Asn Ala Lys
225 230 235 240

Phe Pro Met Phe Thr Ser Cys Cys Pro Ala Trp Val Asn Tyr Val Glu
245 250 255

Gln Ser Ala Pro Asp Phe Ile Pro Asn Leu Ser Ser Cys Arg Ser Pro
260 265 270

Gln Gly Met Leu Ser Ala Leu Ile Lys Asn Tyr Leu Pro Lys Leu Leu
275 280 285

Asp Val Lys Gln Glu Asp Val Leu Asn Phe Ser Ile Met Pro Cys Thr
290 295 300

Ala Lys Lys Asp Glu Val Glu Arg Pro Glu Leu Arg Thr Lys Ser Gly
305 310 315 320

Pro Lys Glu Thr Asp Met Val Leu Thr Val Arg Glu Leu Val Glu Met
325 330 335

Ile Lys Leu Ser Asn Ile Asp Phe Asn Asn Leu Pro Asp Thr Gln Phe
340 345 350

Asp Asn Ile Phe Gly Phe Gly Ser Gly Ala Gly Gln Ile Phe Ala Ala
355 360 365

Thr

<210> 43
<211> 369
<212> PRT
<213> Trichomonas gallinae

<400> 43

Cys Asp Gly Lys Trp Leu Ser Pro Ala Cys Val Thr Thr Val Trp Asp
1 5 10 15

Gly Leu Arg Ile Asp Thr Lys Ser Lys Val Val Arg Asp Ser Val Glu
20 25 30

Asn Asn Leu Lys Glu Leu Leu Asp Cys His Asp Glu Thr Cys Ser Ser
35 40 45

Cys Val Ala Asn His Arg Cys Gln Phe Arg Asp Met Asn Val Ala Tyr
50 55 60

Ser Val Lys Ala Asp Thr Lys Glu Ile Cys Ser Glu Glu Gly Ile Asp

65

70

75

80

Glu Ser Thr His Ala Ile Arg Leu Asp Thr Ser Lys Cys Val Leu Cys
85 90 95

Gly Arg Cys Ile Arg Ala Cys Glu Glu Val Ala Gly Thr Ser Ala Ile
100 105 110

Ile Phe Gly Asn Arg Ala Lys His Met Arg Ile Gln Pro Thr Phe Gly
115 120 125

Gly Thr Leu Gln Glu Thr Ala Cys Ile Lys Cys Gly Gln Cys Thr Leu
130 135 140

Tyr Cys Pro Val Gly Ala Ile Thr Glu Lys Ser Gln Val Lys Glu Ala
145 150 155 160

Leu Asp Ile Leu Ala Asn Lys Gly Lys Lys Val Thr Val Val Gln Val
165 170 175

Ala Pro Ala Val Arg Val Ala Leu Ser Glu Ala Phe Gly Tyr Lys Glu
180 185 190

Gly Thr Val Thr Thr Gly Lys Met Val Ser Ala Leu Lys Ala Leu Gly
195 200 205

Phe Asp Leu Val Tyr Asp Thr Asn Tyr Gly Ala Asp Leu Thr Ile Cys
210 215 220

Glu Glu Ala Gly Glu Leu Val Asn Arg Leu Lys Asp Pro Lys Ala Val
225 230 235 240

Phe Pro Met Phe Thr Ser Cys Cys Pro Ala Trp Val Asn Tyr Val Glu
245 250 255

Gln Ser Ala Pro Asp Phe Ile Pro Asn Leu Ser Ser Cys Arg Ser Pro
260 265 270

Gln Gly Met Leu Ser Ser Leu Ile Lys Asn Tyr Leu Pro Lys Leu Leu
275 280 285

Gly Ile Lys Gln Glu Glu Val Met Asn Phe Ser Ile Met Pro Cys Thr
290 295 300

Ala Lys Lys Asp Glu Ile Glu Arg Pro Glu Leu Gln Thr Lys Thr Gly
305 310 315 320

Leu Lys Glu Thr Asp Met Val Leu Thr Val Arg Glu Leu Val Glu Met
325 330 335

Ile Lys Leu Ser Asn Ile Asp Phe Asn Asn Leu Pro Asp Thr Pro Phe
340 345 350

060513 second sequence listing formatted.txt

Asp Asn Ile Phe Gly Phe Gly Ser Gly Ala Gly Gln Ile Phe Ala Ala
355 360 365

Thr

<210> 44
<211> 456
<212> PRT
<213> Nyctotherus ovalis
<400> 44

Met Ile Ser Arg Leu Ile Ala Lys Lys Ala Pro Leu Phe Leu Arg Thr
1 5 10 15

Phe Ala Thr Ser Glu Met Ile Ser Leu Lys Ile Asp Gly Lys Ile Ile
20 25 30

Ser Val Pro Lys Gly Ile Met Leu Ala Asp Ala Ile Lys Lys Ala Gly
35 40 45

Ala Asn Val Pro Thr Met Cys Tyr His Pro Asp Leu Pro Thr Ser Gly
50 55 60

Gly Ile Cys Arg Val Cys Leu Val Glu Ser Ala Lys Ser Pro Gly Tyr
65 70 75 80

Pro Ile Ile Ser Cys Arg Thr Pro Val Glu Glu Gly Met Glu Ile Val
85 90 95

Thr Gln Gly Ser Lys Met Lys Glu Tyr Arg Gln Ala Asn Leu Ala Leu
100 105 110

Met Leu Ser Arg His Pro Asn Ala Cys Leu Ser Cys Thr Ser Asn Thr
115 120 125

Asn Cys Lys Thr Gln Glu Leu Ser Ala Asn Met Asn Ile Gly Gln Cys
130 135 140

Gly Phe Ala Asn Ala Thr Pro Pro Lys Asn Asp Asp Ser Tyr Asp Met
145 150 155 160

Thr Thr Ala Ile Glu Arg Asp Asn Asp Lys Cys Ile Asn Cys Asp Ile
165 170 175

Cys Val His Thr Cys Ser Leu Gln Gly Leu Asn Ala Leu Gly Phe Tyr
180 185 190

Asn Glu Glu Gly His Ala Val Lys Ser Met Gly Thr Leu Asp Val Ser
195 200 205

Glu Cys Ile Gln Cys Gly Gln Cys Ile Asn Arg Cys Pro Thr Gly Ala
210 215 220

060513 second sequence listing formatted.txt

Ile Thr Glu Lys Ser Glu Ile Arg Pro Val Leu Asp Ala Ile Asn Ile
225 230 235 240

Gln Gln Arg Leu Val Phe Gln Met Ala Pro Ser Ile Arg Val Ala Val
245 250 255

Ala Glu Glu Phe Gly Ile Lys Pro Gly Glu Lys Ile Leu Lys Asn Glu
260 265 270

Ile Ala Thr Ala Leu Arg Lys Leu Gly Ser Asn Val Phe Val Leu Asp
275 280 285

Thr Asn Phe Ser Ala Asp Leu Thr Ile Ile Glu Glu Gly His Glu Leu
290 295 300

Ile Glu Arg Leu Tyr Arg Asn Val Thr Gly Lys Lys Leu Leu Gly Gly
305 310 315 320

Asp His Met Pro Ile Asp Leu Pro Met Leu Thr Ser Cys Cys Pro Gly
325 330 335

Trp Ile Met Phe Ile Glu Lys Asn Tyr Pro Asp Leu Leu Asn Asn Leu
340 345 350

Ser Thr Cys Lys Ser Pro Gln Gly Met Leu Gly Ala Leu Ile Lys Gly
355 360 365

Tyr Trp Ala Lys Asn Ile Lys Lys Met Asp Pro Lys Asp Ile Val Ser
370 375 380

Val Ser Ile Met Pro Cys Thr Ala Lys Lys Ala Glu Lys Glu Arg Pro
385 390 395 400

Gln Leu Arg Gly Asp Glu Gly Tyr Lys Asp Val Asp Tyr Ile Leu Thr
405 410 415

Thr Arg Glu Leu Ala Lys Met Leu Lys Gln Ser Asn Ile Asp Leu Ala
420 425 430

Lys Met Glu Pro Thr Pro Phe Asp Lys Val Met Ser Glu Gly Thr Gly
435 440 445

Ala Ala Val Ile Phe Gly Val Thr
450 455

<210> 45
<211> 369
<212> PRT
<213> Trichomonas vaginalis

<400> 45

Cys Asp Gly Lys Trp Leu Ala Pro Ala Cys Val Thr Thr Val Trp Asp
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1           5           10           15
Gly Leu Lys Ile Asp Thr Lys Ser Lys Met Val Lys Glu Ser Val Glu
      20      25      30
Asn Asn Leu Lys Glu Leu Leu Asp Cys His Asp Glu Thr Cys Ser Ser
      35      40      45
Cys Val Ala Asn His Arg Cys Gln Phe Arg Asp Met Asn Val Ala Tyr
      50      55      60
Ser Ile Lys Ala Glu Thr Lys Glu Glu Cys Ser Glu Glu Gly Ile Asp
      65      70      75      80
Glu Ser Thr Asn Ser Ile Arg Leu Asp Thr Ser Lys Cys Val Leu Cys
      85      90      95
Gly Arg Cys Ile Arg Ala Cys Glu Glu Val Ala Gly Gln Ser Ala Ile
      100     105     110
Ile Phe Gly Asn Arg Ala Lys His Met Arg Ile Gln Pro Thr Phe Gly
      115     120     125
Gln Thr Leu Gln Asp Thr Ser Cys Ile Lys Cys Gly Gln Cys Thr Leu
      130     135     140
Tyr Cys Pro Val Gly Ala Ile Thr Glu Lys Ser Gln Val Lys Gln Ala
      145     150     155     160
Leu Asp Ile Leu Ser Asn Lys Gly Lys Lys Ile Ser Val Ile Gln Val
      165     170     175
Ala Pro Ala Val Arg Val Ala Leu Ser Glu Ala Phe Gly Tyr Lys Glu
      180     185     190
Gly Ser Val Thr Thr Gly Lys Met Val Ser Ala Leu Lys Ala Leu Gly
      195     200     205
Phe Asp Tyr Val Tyr Asp Thr Asn Tyr Ser Ala Asp Leu Thr Ile Val
      210     215     220
Glu Glu Ala Gly Glu Leu Val Gln Arg Leu Lys Asn Pro Asn Ala Val
      225     230     235     240
Phe Pro Met Phe Thr Ser Cys Cys Pro Ala Trp Val Asn Tyr Val Glu
      245     250     255
Gln Ser Ala Pro Asp Phe Ile Pro Asn Leu Ser Ser Cys Arg Ser Pro
      260     265     270
Gln Gly Met Leu Ser Ser Leu Val Lys Asn Tyr Leu Pro Lys Val Leu
      275     280     285

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060513 second sequence listing formatted.txt

Asn Ile Pro Val Glu Asp Val Leu Asn Phe Ser Ile Met Pro Cys Thr
 290 295 300

Ala Lys Lys Asp Glu Ile Glu Arg Pro Glu Leu Arg Thr Lys Asp Gly
 305 310 315 320

His Lys Glu Thr Asp Met Val Leu Thr Val Arg Glu Leu Val Glu Met
 325 330 335

Ile Lys Leu Ser Gly Ile Asp Phe Asn Asn Leu Pro Asp Thr Pro Phe
 340 345 350

Asp Ser Ile Phe Gly Phe Gly Ser Gly Ala Gly Gln Ile Phe Ala Ala
 355 360 365

Thr

<210> 46
 <211> 464
 <212> PRT
 <213> Entamoeba histolytica

<400> 46

Arg Leu His Thr Val Thr Gly His Asp His Asn His Ser Ile Gln Phe
 1 5 10 15

Asp Trp Ser Lys Cys Met Gly Cys Gly Met Cys Ala Thr Lys Cys Thr
 20 25 30

Phe Gly Val Leu Val Lys Gln Pro Pro Lys Ile Pro Pro Phe Val Gln
 35 40 45

Pro Asn Arg Glu Lys Leu Ser Gln Glu Asn Thr Asp Lys Thr Arg Val
 50 55 60

Leu Ile Asp Glu Ser Glu Cys Thr Gly Cys Gly Gln Cys Ser Leu Val
 65 70 75 80

Cys Asn Phe Gly Ser Ile Thr Pro Ile Asp His Leu Val Asp Thr Phe
 85 90 95

Lys Ala Lys Glu Ala Gly Lys Lys Leu Val Ala Met Ile Ala Pro Ser
 100 105 110

Thr Arg Leu Gly Val Ala Glu Ala Met Gly Met Pro Ile Gly Ser Thr
 115 120 125

Ala Met Ala Gln Leu Val His Cys Leu Arg Leu Ile Gly Phe Asp Tyr
 130 135 140

Val Phe Asp Val Asp Ala Gly Ala Asp Lys Thr Thr Met Asp Asp Tyr
 145 150 155 160

Ala Glu Val Ile Glu Met Lys Lys Glu Gly Lys Gly Pro Ala Ile Thr
 165 170 175
 Ser Cys Cys Pro Ala Trp Ile Glu Leu Val Glu Lys Glu Tyr Pro Asp
 180 185 190
 Leu Ile Pro Asn Val Ser Thr Ala Arg Ser Pro Ile Gly Cys Leu Ala
 195 200 205
 Gly Cys Ile Lys Arg Gly Trp Ala Lys Asp Val Gly Ile Ala Val Glu
 210 215 220
 Asp Leu Tyr Thr Val Gly Ile Met Pro Cys Ile Ala Lys Lys Thr Glu
 225 230 235 240
 Ser Gln Arg Gln Gln Ile His Gln Asp Tyr Asp Ala Ser Cys Thr Ser
 245 250 255
 Asn Glu Ile Ala Ala Tyr Phe Lys Lys His Leu Pro Pro Glu Glu Cys
 260 265 270
 Lys Phe Thr Gln Glu Arg Glu Glu Ala Leu Ala Lys Thr Glu Asp Gly
 275 280 285
 Gln Cys Asp Leu Pro Phe Arg Arg Ile Ser Gly Gly Ser Asn Ile Phe
 290 295 300
 Gly Arg Thr Gly Gly Val Cys Glu Thr Val Leu Arg Val Ile Ala Arg
 305 310 315 320
 Asn Ala Gly Val Asp Trp Asn Ser Cys Thr Val Asn Lys Glu Glu Thr
 325 330 335
 Phe Lys His Ala Ala Ser Gly Ser Thr Met Thr Asn Leu Ser Val Asp
 340 345 350
 Ile Gly Gly Thr Ile Ile Thr Gly Ala Val Cys His Gly Gly Tyr Ala
 355 360 365
 Ile Arg His Ala Cys Glu Leu Ile Arg Lys Gly Glu Leu Lys Val Asp
 370 375 380
 Val Val Glu Met Met Ala Cys Val Gly Gly Cys Leu Gly Gly Ala Gly
 385 390 395 400
 Gln Pro Lys Ile Pro Pro Ala Lys Lys Leu Glu Met Asp Lys Arg Arg
 405 410 415
 Val Met Leu Asp Ile Leu Asp Gln Gln Thr Asp Ile Arg Ala Ala Asn
 420 425 430

Glu Asn Thr Asp Val Leu Gly Trp Ile Asp Lys His Phe Asp His Gln
 435 440 445

Gly Ala His Gln His Leu His Thr Tyr Phe Thr Pro Arg Tyr Gln Asn
 450 455 460

<210> 47
 <211> 474
 <212> PRT
 <213> Giardia intestinalis
 <400> 47

Met Pro Pro Lys Pro Gln His Asp Val Thr Gly Val Asp Ser Asn Asn
 1 5 10 15

Ala Ile Met Ile Asp Tyr Ala Lys Cys Ile Gly Cys Asn Met Cys Ile
 20 25 30

Lys Ala Cys Asp Val Gln Gly Ile Gly Val Tyr Lys Gln Asn Glu Lys
 35 40 45

Pro Lys Tyr Pro Pro Ile Val Lys Leu Ser Thr Leu Phe Asn Ser Asp
 50 55 60

Cys Ile Gly Cys Gly Gln Cys Ala Thr Ile Cys Pro Val Asp Ala Ile
 65 70 75 80

Ala Pro Lys Asn Asn Leu Glu Ile Tyr Lys Gly Glu Ser Ala Ser Lys
 85 90 95

Lys Val Arg Val Ala Leu Ile Ala Pro Ser Thr Arg Val Ala Phe Gly
 100 105 110

Asp Val Phe Gly Leu Pro Ile Gly Thr Asn Thr Ile Tyr Ser Leu Ile
 115 120 125

Arg Met Leu Lys Gln Tyr Leu Gly Phe Asp Tyr Val Phe Asp Val Asn
 130 135 140

Phe Gly Ala Asp Glu Thr Thr Val Ile Asp Thr Gln Glu Leu Leu His
 145 150 155 160

Phe Lys His Glu Gly Arg Gly Pro Val Phe Thr Ser Cys Cys Pro Ala
 165 170 175

Trp Val Asn Leu Cys Glu Met Lys Tyr Pro Glu Leu Leu Pro Gln Val
 180 185 190

Ser Thr Ala Lys Ser Cys Val Ala Met Val Ala Thr Leu Val Lys Arg
 195 200 205

Arg Trp Val Gln Glu His Leu Ile Pro Lys Gly Ile Val Asp Ser Val
 210 215 220

060513 second sequence listing formatted.txt

Asp Asp Val Tyr Val Ala Asp Ile Met Pro Cys Thr Ala Lys Lys Asp
 225 230 235 240
 Glu Ser Met Arg Pro Gln Leu Asn Arg Asp Val Asp Ile Cys Leu Thr
 245 250 255
 Val Arg Glu Val Ala Glu His Leu Tyr Phe Leu His Gly Ala Arg Leu
 260 265 270
 Thr Leu Glu Glu Val Glu Ala Asp Ala Leu Val Leu Arg Pro Gly Arg
 275 280 285
 Ser Thr Gln Lys Lys Trp Asp Phe Asp Ala Pro Phe Asn Thr Val Ser
 290 295 300
 Gly Gly Ser His Ile Phe Gly Lys Thr Gly Gly Val Ala Glu Thr Cys
 305 310 315 320
 Leu Arg Phe Ile Ser Tyr Met Lys Lys Ser Pro Ile Glu Asn Val Lys
 325 330 335
 Glu Glu Leu Leu Lys Glu Phe Lys Thr Pro Gly Gln Leu Val Gln Thr
 340 345 350
 Val Lys Leu Val Ser Cys Glu Ile Ala Gly Glu Thr Tyr Arg Ala Leu
 355 360 365
 Ile Ala His Gly Gly Ser Ala Ile Asn Ala Ala Arg Met Val Leu
 370 375 380
 Asn Lys Glu Val Glu Cys Asp Val Val Glu Gln Met Ala Cys Pro Gly
 385 390 395 400
 Gly Cys Gln Asn Gly Gly Gly Met Pro Lys Ile Lys Gly Lys Lys Glu
 405 410 415
 Ala Val Leu Thr Arg Ala Ser Thr Leu Asp Ile Leu Asp Gly Lys Glu
 420 425 430
 Arg Phe Ala Ser Ala Gly Glu Asn Lys Thr Leu Trp Gly Phe Asn Gly
 435 440 445
 Cys Leu Thr Glu His Glu Ala His Glu Leu Leu His Thr His Tyr Gln
 450 455 460
 His Arg Pro Val Glu Ser Leu Leu Pro Gln
 465 470

<210> 48
 <211> 844
 <212> PRT
 <213> Desulfitobacterium hafniense

<400> 48

Met Val Lys Ile Ile Ser Ile Thr Asn Asn Ala Lys Arg Gln Gly Lys
 1 5 10 15

Gly Thr Ser Arg Lys Glu Lys Gln Ala Met Lys Glu Val Thr Lys Gln
 20 25 30

Gln Arg Ile Arg Val Thr Val Asn Gly Arg Gln Met Glu Val Tyr Gly
 35 40 45

Asp Leu Thr Ile Leu Gln Ala Leu Leu Gln Glu Asp Ile His Ile Pro
 50 55 60

His Leu Cys Tyr Asp Ile Arg Leu Glu Arg Ser Asn Gly Asn Cys Gly
 65 70 75 80

Leu Cys Val Val Glu Leu Gly Glu Gly Ser Glu Gln Gln Asp Val Lys
 85 90 95

Ala Cys His Thr Pro Ile Gln Glu Gly Met Ile Ile His Thr Asn Ser
 100 105 110

Pro Arg Leu Glu His Tyr Arg Lys Ile Arg Leu Glu Gln Ile Leu Ala
 115 120 125

Asp His Asn Ala Asp Cys Val Ala Pro Cys Val Met Thr Cys Pro Ala
 130 135 140

Asn Ile Asp Ile Gln Ser Tyr Leu Ser His Ala Gly Asn Gly Asn Phe
 145 150 155 160

Glu Thr Ala Ile Lys Val Ile Lys Glu Arg Asn Pro Phe Pro Ile Val
 165 170 175

Cys Gly Arg Val Cys Pro His Ser Cys Glu Ala Gln Cys Arg Arg Asn
 180 185 190

Leu Ile Asp Glu Pro Val Ala Ile Asn His Val Lys Arg Phe Ile Ala
 195 200 205

Asp Trp Asp Ile Ala His Glu Gln Pro Trp Ala Pro Arg Lys Lys Ala
 210 215 220

Ala Thr Gly Lys Lys Ile Ala Val Val Gly Ala Gly Ser Ser Gly Leu
 225 230 235 240

Ser Ala Ala Tyr Tyr Ser Ala Ile Gln Gly His Asp Val Thr Val Phe
 245 250 255

Glu Arg His Pro Arg Ala Gly Gly Met Met Arg Tyr Gly Ile Pro Glu
 260 265 270

Tyr Arg Leu Pro Lys Glu Thr Leu Asp Arg Glu Ile Gly Leu Ile Ala
 275 280 285

Asp Leu Gly Val Lys Ile Met Thr Asn Lys Ala Leu Gly Thr His Ile
 290 295 300

Arg Leu Glu Asp Leu His Gln Asp Phe Asp Ala Val Tyr Leu Ala Ile
 305 310 315 320

Gly Ser Trp Arg Ala Thr Pro Leu Gln Ile Glu Gly Asp Asn Leu Glu
 325 330 335

Gly Val Trp Leu Gly Ile Asn Phe Leu Glu Gln Val Thr Lys Gly Ala
 340 345 350

Asp Ile Lys Leu Gly Glu His Val Val Val Ile Gly Gly Gly Asn Thr
 355 360 365

Ala Ile Asp Cys Ala Arg Thr Ala Leu Arg Lys Gly Ala Gly Ser Val
 370 375 380

Lys Leu Val Tyr Arg Arg Thr Arg Glu Glu Met Pro Ala Glu Ser Tyr
 385 390 395 400

Glu Val Glu Glu Ala Ile His Glu Gly Val Glu Met Tyr Phe Leu Thr
 405 410 415

Ala Pro His Lys Ile Val Ala Glu Gly Gly Arg Lys Leu Leu His Cys
 420 425 430

Ile Lys Met Thr Leu Gly Glu Pro Asp Arg Ser Gly Arg Arg Arg Pro
 435 440 445

Ile Pro Ile Glu Gly Ser Glu Thr Ala Phe Glu Ala Asp Thr Ile Ile
 450 455 460

Gly Ala Ile Gly Gln Ser Thr Asn Thr Gln Phe Leu Tyr His Asp Leu
 465 470 475 480

Pro Val Lys Leu Asn Lys Trp Gly Asp Ile Glu Ile Asn Gly Lys Thr
 485 490 495

Met Gln Thr Ser Glu Met Asn Ile Phe Ala Gly Gly Asp Cys Val Thr
 500 505 510

Gly Pro Ala Thr Val Ile Gln Ala Val Ala Ala Gly Arg His Ala Ala
 515 520 525

Glu Ala Met Asp Ser Phe Leu Met Lys Gly Tyr Val Lys Glu Gln Pro
 530 535 540

Met Asp Tyr Ser Cys Ser Arg Gly Ser Leu Glu Asp Leu Pro Gln Trp
 545 550 555 560

060513 second sequence listing formatted.txt

Glu Phe Glu Lys Ile Pro Arg Leu Lys Arg Ala Pro Met Pro Ala Leu
565 570 575

Pro Pro Ala Glu Arg Arg Asp Asn Phe Arg Glu Val Glu Thr Gly Leu
580 585 590

Ser Glu Glu Thr Ala Arg Ala Glu Ala Arg Arg Cys Leu Lys Cys Gly
595 600 605

Cys Tyr Glu Arg Tyr Asp Cys Asp Leu Arg Gln Glu Ala Ser Leu His
610 615 620

His Val Glu Phe Lys Lys Pro Val His Glu Arg Pro Tyr Ile Pro Ile
625 630 635 640

Val Glu Asp His Ser Ile Ile Ile Arg Asp His Asn Lys Cys Ile Ser
645 650 655

Cys Gly Arg Cys Ile Ala Ala Cys Ala Glu Val Glu Gly Pro Asp Ile
660 665 670

Leu Ser Phe Tyr Met Lys His Gly Arg Gln Leu Val Gly Thr Lys Ser
675 680 685

Gly Leu Pro Leu Asp Gln Thr Asp Cys Val Ser Cys Gly Gln Cys Val
690 695 700

Asn Ala Cys Pro Cys Gly Ala Leu Asp Tyr Arg Ser Glu Ile Gly Arg
705 710 715 720

Val Phe Arg Ala Ile Asn Asp Pro Gly Lys Thr Thr Val Ala Phe Val
725 730 735

Ala Pro Ala Val Arg Ser Val Val Ser Ser Gln Tyr Gly Val Ser Tyr
740 745 750

Gln Glu Ala Ser Arg Phe Ile Ala Gly Leu Leu Lys Lys Ile Gly Phe
755 760 765

Asp Lys Val Phe Asp Phe Thr Phe Ala Ala Asp Leu Thr Ile Val Glu
770 775 780

Glu Thr Thr Glu Phe Leu Thr Arg Leu Gln Ser His Lys Pro Ile Pro
785 790 795 800

Gln Phe Thr Ser Cys Cys Pro Gly Trp Val Asn Phe Val Glu Arg Arg
805 810 815

Tyr Pro Glu Ile Ile Pro Tyr Leu Ser Ser Cys Lys Ser Pro Gln Met
820 825 830

Met Met Gly Ala Thr Val Lys Ile Thr Leu Arg Asn
835 840

<210> 49
<211> 119
<212> PRT
<213> Nyctotherus velox

<400> 49

Ile Leu Phe Met Glu Lys Asn Tyr Pro Asp Met Leu Asn His Leu Ser
1 5 10 15

Thr Cys Lys Ser Pro Gln Gly Met Leu Gly Ala Leu Ile Lys Gly Tyr
20 25 30

Trp Ala Lys Asn Val Lys Lys Ile Asp Pro Lys Asp Val Val Ser Val
35 40 45

Ser Ile Met Pro Cys Thr Ala Lys Lys Glu Glu Lys Asp Arg Ile Thr
50 55 60

Leu Lys Ser Asp Glu Gly Tyr Asn Asn Val Asp Tyr Val Leu Thr Thr
65 70 75 80

Arg Glu Leu Ala Lys Met Phe Lys Gln Ser Asn Ile Asp Pro Ser Lys
85 90 95

Leu Pro Pro Thr Gln Phe Asp Asn Val Met Ser Glu Gly Thr Gly Ala
100 105 110

Ala Val Ile Phe Gly Val Thr
115

<210> 50
<211> 476
<212> PRT
<213> Oryza sativa

<400> 50

Met Ala Ser Ser Ser Ser Ser Ala Ser Ser Arg Phe Ser Pro Ala Leu
1 5 10 15

Gln Ala Ser Asp Leu Asn Asp Phe Ile Ala Pro Ser Gln Asp Cys Ile
20 25 30

Ile Ser Leu Asn Lys Gly Pro Ser Ala Arg Arg Leu Pro Ile Lys Gln
35 40 45

Lys Glu Ile Ala Val Ser Thr Asn Pro Pro Glu Glu Ala Val Lys Ile
50 55 60

Ser Leu Lys Asp Cys Leu Ala Cys Ser Gly Cys Ile Thr Ser Ala Glu
65 70 75 80

Thr Val Met Leu Glu Lys Gln Ser Leu Gly Asp Phe Ile Thr Arg Ile
 85 90 95
 Asn Ser Asp Lys Ala Val Ile Val Ser Val Ser Pro Gln Ser Arg Ala
 100 105 110
 Ser Leu Ala Ala Phe Phe Gly Leu Ser Gln Ser Gln Val Phe Arg Lys
 115 120 125
 Leu Thr Ala Leu Phe Lys Ser Met Gly Val Lys Ala Val Tyr Asp Thr
 130 135 140
 Ser Ser Ser Arg Asp Leu Ser Leu Ile Glu Ala Cys Ser Glu Phe Val
 145 150 155 160
 Thr Arg Tyr His Gln Asn Gln Leu Ser Ser Gly Lys Glu Ala Gly Lys
 165 170 175
 Asn Leu Pro Met Leu Ser Ser Ala Cys Pro Gly Trp Ile Cys Tyr Ala
 180 185 190
 Glu Lys Thr Leu Gly Ser Phe Ile Leu Pro Tyr Ile Ser Ala Val Lys
 195 200 205
 Ser Pro Gln Gln Ala Ile Gly Ala Ala Ile Lys His His Met Val Gly
 210 215 220
 Lys Leu Gly Leu Lys Pro His Asp Val Tyr His Val Thr Val Met Pro
 225 230 235 240
 Cys Tyr Asp Lys Lys Leu Glu Ala Val Arg Asp Asp Phe Val Phe Ser
 245 250 255
 Val Glu Asp Lys Asp Val Thr Glu Val Asp Ser Val Leu Thr Thr Gly
 260 265 270
 Glu Val Leu Asp Leu Ile Gln Ser Arg Ser Val Asp Phe Lys Thr Leu
 275 280 285
 Glu Glu Ser Pro Met Asp Arg Leu Leu Thr Asn Val Asp Asp Asp Gly
 290 295 300
 Gln Leu Tyr Gly Val Ser Gly Gly Ser Gly Gly Tyr Ala Glu Thr Val
 305 310 315 320
 Phe Arg His Ala Ala His Val Leu Phe Asp Arg Lys Ile Glu Gly Ser
 325 330 335
 Val Asp Phe Arg Ile Leu Arg Asn Ser Asp Phe Arg Glu Val Thr Leu
 340 345 350
 Glu Val Glu Gly Lys Pro Val Leu Lys Phe Ala Leu Cys Tyr Gly Phe
 355 360 365

060513 second sequence listing formatted.txt

Arg Asn Leu Gln Asn Ile Ile Arg Lys Ile Lys Met Gly Lys Cys Glu
370 375 380

Tyr His Phe Ile Glu Val Met Ala Cys Pro Ser Gly Cys Leu Asn Gly
385 390 395 400

Gly Gly Gln Ile Lys Pro Ala Lys Gly Gln Ser Ala Lys Asp Leu Ile
405 410 415

Gln Leu Leu Glu Asp Val Tyr Ile Gln Asp Val Ser Val Ser Asn Pro
420 425 430

Phe Glu Asn Pro Ile Ala Lys Arg Leu Tyr Asp Glu Trp Leu Gly Gln
435 440 445

Pro Gly Ser Glu Asn Ala Lys Lys Tyr Leu His Thr Lys Tyr His Pro
450 455 460

Val Val Lys Ser Val Ala Ser Gln Leu Gln Asn Trp
465 470 475

<210> 51
<211> 114
<212> PRT
<213> Psalteriomonas lanterna

<400> 51

Ile Asn Leu Val Glu Lys His Tyr Pro Glu Tyr Leu Pro Asn Leu Ser
1 5 10 15

Ser Cys Arg Ser Pro Gln Gly Met Leu Ser Ser Leu Ile Lys Asn Tyr
20 25 30

Trp Ala Lys Lys Met Gly Ile Glu Pro Lys Asp Val Val Val Val Ser
35 40 45

Phe Met Pro Cys Gly Ala Lys Lys Asp Glu Ile Lys Arg Pro Gln Leu
50 55 60

Lys Gly Glu Thr Asp Tyr Val Leu Thr Thr Arg Glu Leu Gly Lys Leu
65 70 75 80

Phe Lys Met Gly Gly Leu Asn Asp Leu Ser Val Leu Glu Pro Val Lys
85 90 95

Tyr Asp Asp Pro Leu Gly Glu Ser Thr Gly Ala Ala Val Ile Phe Gly
100 105 110

Ala Thr

<210> 52

<211> 119

<212> PRT

<213> Nyctotherus ovalis

<400> 52

Ile Met Phe Met Glu Lys Asn Tyr Pro Asp Met Leu Asn His Leu Ser
1 5 10 15

Thr Cys Lys Ser Pro Gln Gly Met Leu Gly Ala Leu Ile Lys Gly Tyr
20 25 30

Trp Ala Lys Asn Ile Lys Lys Met Asp Pro Lys Asp Ile Val Ser Val
35 40 45

Ser Ile Met Pro Cys Thr Ala Lys Lys Ala Glu Lys Glu Arg Pro Gln
50 55 60

Leu Arg Gly Asp Glu Gly Tyr Lys Asp Val Asp Tyr Ile Leu Thr Thr
65 70 75 80

Arg Glu Leu Ala Lys Met Leu Lys Gln Ser Asn Ile Asp Leu Gly Lys
85 90 95

Met Glu Pro Thr Pro Phe Asp Lys Val Met Ser Glu Gly Thr Gly Ala
100 105 110

Ala Val Ile Phe Gly Val Thr
115

<210> 53

<211> 119

<212> PRT

<213> Nyctotherus ovalis

<400> 53

Ile Met Phe Met Glu Lys Asn Tyr Pro Asp Met Leu Asn His Leu Ser
1 5 10 15

Thr Cys Lys Ser Pro Gln Gly Met Leu Gly Ala Leu Ile Lys Gly Tyr
20 25 30

Trp Ala Lys Asn Val Lys Lys Met Asp Pro Lys Asp Ile Val Ser Val
35 40 45

Ser Ile Met Pro Cys Thr Ala Lys Lys Ala Glu Lys Glu Arg Pro Gln
50 55 60

Leu Arg Gly Asp Glu Gly Tyr Lys Asp Val Asp Tyr Ile Leu Thr Thr
65 70 75 80

Arg Glu Leu Ala Lys Met Leu Lys Gln Ser Asn Ile Asp Leu Gly Lys
85 90 95

Met Glu Pro Arg Pro Phe Asp Lys Val Met Ser Glu Gly Thr Gly Ala

100

105

110

Ala Val Ile Phe Gly Val Thr
115

<210> 54
<211> 520
<212> PRT
<213> Rhodospirillum rubrum

<400> 54

Met Arg Pro Val Gln Arg Pro Arg Arg Trp Pro Gly Leu Arg Gln Arg
1 5 10 15

Leu Ser Pro Glu Arg Pro Val Asp Arg Arg Ser Arg Arg Arg Ser Gly
20 25 30

Ala Ala Arg Pro Gly Arg Arg Arg Gly Ser Gly Val Gln His Glu Ile
35 40 45

Leu Arg Ser Val Ser Gln Arg Asp Met Ser Met Ser Ile Gln Pro Thr
50 55 60

Val Thr Ile Asp Pro Glu Leu Cys Thr Gly Cys Gly Arg Cys Val Glu
65 70 75 80

Thr Cys Pro Val Gln Ala Ile Ala Gly Ser Arg Gly Lys Ala His Glu
85 90 95

Ile Glu Ala Ala Ala Cys Val Ser Cys Gly Arg Cys Val Ala Thr Cys
100 105 110

Ala Ala Phe Asp Ser Ile Phe Asp Ala Phe Pro Thr Pro Arg Pro Val
115 120 125

Arg Leu Lys Arg Arg Gly Leu Pro Gly Ser Leu Lys Glu Pro Leu Phe
130 135 140

Ala Ala His Asp Pro Ser Arg Ile Glu Ala Val Arg Lys Ala Phe Ala
145 150 155 160

Thr Pro Lys Arg Met Thr Val Met Gln Val Asp Thr Met Ala Cys Val
165 170 175

Ala Leu Ala Glu Asp Phe Gly Leu Pro Pro Gly Ser Leu Ser Pro Leu
180 185 190

Lys Ile Ala Ser Ala Ala Arg Gln Leu Gly Phe Asp Arg Val Tyr Arg
195 200 205

Thr Ser Phe Pro Ala Gly Leu Ala Val Leu Glu Thr Ala His Glu Met
210 215 220

Ala Ala Arg Leu Ala Asn Gly Gly Asn Leu Pro Val Ile Asn Ser Ser
 225 230 235 240
 Cys Pro Ala Val Val Ala Phe Leu Glu Arg Arg Tyr Pro Glu Leu Leu
 245 250 255
 His Tyr Leu Ser Thr Val Lys Ser Pro His Gln Ile Ala Gly Ala Leu
 260 265 270
 Tyr Asn Ser Tyr Leu Ala Asp Ala Ala Asn Leu Ala Pro Ala Asn Ile
 275 280 285
 His Lys Val Ser Val Val Ala Cys Leu Ser His Lys Ala Glu Ala Glu
 290 295 300
 Arg Pro Glu Met Met Thr Cys Gly Cys Pro Asp Ile Asp Thr Val Leu
 305 310 315 320
 Thr Ala Arg Glu Leu Ala Ile Leu Ile Lys Asp Ala Gly Ile Asp Val
 325 330 335
 Pro Leu Leu Gly Asp Gly Glu Phe Asp Asn Asp Phe Pro Glu Ile Glu
 340 345 350
 Gly Leu Asp Thr Leu Tyr Cys Ala Pro Gly Asp Val Ser Arg Ala Val
 355 360 365
 Leu Gly Ala Gly Arg Trp Phe Leu Gly Gln Gly Glu Gly Val Gly Ala
 370 375 380
 Pro Ala Gly Glu Thr Val Glu Val Leu Asp Glu Ala Thr Arg Leu Thr
 385 390 395 400
 Arg Leu Ala Tyr Pro Gly Gly Thr Leu Gln Ala Leu Thr Val Ala Gly
 405 410 415
 Phe Asp Lys Ala Val Pro Tyr Leu Glu Ala Ile Lys Ala Gly Arg Asn
 420 425 430
 Ala Phe Gln Phe Leu Glu Ile Ala Ser Cys Pro Gln Gly Cys Ala Ser
 435 440 445
 Gly Ala Gly Leu Pro Lys Val Leu Leu Glu Thr Glu Lys Pro Ala Arg
 450 455 460
 Tyr Arg Ala Arg Ile Glu Asn Leu Pro Pro Ala Ala Pro Glu Ala Trp
 465 470 475 480
 Ser Arg Leu Pro Gly His Pro Ser Ile Val Ala Leu Tyr Gly Gly Tyr
 485 490 495
 Phe Gly Lys Ala Ile Gly Asp Lys Ser Asn Arg Arg Leu His Thr Gln
 500 505 510

Tyr Ala Glu Pro Ala Ala Ala Pro
 515 520

<210> 55
 <211> 240
 <212> PRT
 <213> Desulfitobacterium hafniense

<400> 55

Met Ala Val Glu Lys Leu Thr Gly Glu Val Leu Thr Asp Gln Leu Asp
 1 5 10 15

Tyr Gln Glu Val Arg Gly Leu Gln Gly Ile Lys Glu Ala Ala Val Glu
 20 25 30

Ala Lys Gly Lys Lys Val Asn Val Ala Val Ile Ser Gly Leu His Asn
 35 40 45

Val Glu Pro Ile Leu Glu Lys Ile Ile Glu Gly Met Glu Val Gly Tyr
 50 55 60

Asp Leu Ile Glu Val Met Ala Cys Pro Gly Gly Cys Ile Cys Gly Ala
 65 70 75 80

Gly His Pro Val Pro Glu Lys Ile Asp Thr Leu Glu Lys Arg Gln Gln
 85 90 95

Val Leu Val Asn Ile Asp Gln Thr Ser Arg Tyr Arg Lys Ser Gln Glu
 100 105 110

Asn Pro Asp Ile Leu Arg Leu Tyr Asp Glu Tyr Tyr Gly Glu Ala Asn
 115 120 125

Ser Pro Leu Ala His Lys Leu Leu His Thr His Tyr Glu Ala Val Lys
 130 135 140

Arg Glu Pro Val Ala Lys His Asp Arg Arg Met Ala Asp Ser Ala Phe
 145 150 155 160

Val Thr His Glu Leu Thr Leu Cys Thr Cys Asp Lys Cys Thr Ala Gln
 165 170 175

Gly Ser Arg Glu Leu Phe Ala Ala Leu Ser Gly Lys Ile Arg Lys Leu
 180 185 190

Lys Met Asp Ser Phe Val Thr Ala Arg Thr Ile Arg Leu Lys Glu Asn
 195 200 205

His Pro Gly Gln Gly Val Tyr Ala Ala Ile Asp Gly Lys Leu Ile Glu
 210 215 220

Thr Pro Val Glu Gln Leu Glu Gln Arg Ile Phe Gln His Leu Ile Arg

225

230

235

240

<210> 56
 <211> 86
 <212> PRT
 <213> Desulfitobacterium hafniense

<400> 56

Met Val Ser Ile Val Pro Cys Ile Ala Lys Lys Tyr Glu Ala Ala Arg
 1 5 10 15

Pro Glu Phe Arg Ser Glu Gly Ile Arg Asp Val Asp Ala Val Leu Thr
 20 25 30

Ser Thr Glu Met Leu Glu Met Ala Asp Ile Lys Leu Ile Glu Pro Ala
 35 40 45

Asp Val Glu Pro Gln Asp Phe Cys Glu Pro Tyr Lys Arg Val Ser Gly
 50 55 60

Ala Gly Ile Leu Phe Gly Ala Ser Gly Gly Val Ala Lys Arg Pro Cys
 65 70 75 80

Gly Trp Arg Trp Arg Asn
 85

<210> 57
 <211> 477
 <212> PRT
 <213> Drosophila melanogaster

<400> 57

Met Ser Arg Leu Ser Arg Ala Leu Gln Leu Thr Asp Ile Asp Asp Phe
 1 5 10 15

Ile Thr Pro Ser Gln Ile Cys Ile Lys Pro Val Gln Ile Asp Lys Ala
 20 25 30

Arg Ser Lys Thr Gly Ala Lys Ile Lys Ile Lys Gly Asp Gly Cys Phe
 35 40 45

Glu Glu Ser Glu Ser Gly Asn Leu Lys Leu Asn Lys Val Asp Ile Ser
 50 55 60

Leu Gln Asp Cys Leu Ala Cys Ser Gly Cys Ile Thr Ser Ala Glu Glu
 65 70 75 80

Val Leu Ile Thr Gln Gln Ser Arg Glu Glu Leu Leu Lys Val Leu Gln
 85 90 95

Glu Asn Ser Lys Asn Lys Ala Ser Glu Asp Trp Asp Asn Val Arg Thr
 100 105 110

Ile Val Phe Thr Leu Ala Thr Gln Pro Ile Leu Ser Leu Ala Tyr Arg

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115                               120                               125
Tyr Gln Ile Gly Val Glu Asp Ala Ala Arg His Leu Asn Gly Tyr Phe
130                               135                               140
Arg Ser Leu Gly Ala Asp Tyr Val Leu Ser Thr Lys Val Ala Asp Asp
145                               150                               155                               160
Ile Ala Leu Leu Glu Cys Arg Gln Glu Phe Val Asp Arg Tyr Arg Glu
165                               170                               175
Asn Glu Asn Leu Thr Met Leu Ser Ser Ser Cys Pro Gly Trp Val Cys
180                               185                               190
Tyr Ala Glu Lys Thr His Gly Asn Phe Leu Leu Pro Tyr Val Ser Thr
195                               200                               205
Thr Arg Ser Pro Gln Gln Ile Met Gly Val Leu Val Lys Gln Ile Leu
210                               215                               220
Ala Asp Lys Met Asn Val Pro Ala Ser Arg Ile Tyr His Val Thr Val
225                               230                               235                               240
Met Pro Cys Tyr Asp Lys Lys Leu Glu Ala Ser Arg Glu Asp Phe Phe
245                               250                               255
Ser Lys Ala Asn Asn Ser Arg Asp Val Asp Cys Val Ile Thr Ser Val
260                               265                               270
Glu Val Glu Gln Leu Leu Ser Glu Ala Gln Gln Pro Leu Ser Gln Tyr
275                               280                               285
Asp Leu Leu Asp Leu Asp Trp Pro Trp Ser Asn Val Arg Pro Glu Phe
290                               295                               300
Met Val Trp Ala His Glu Lys Thr Leu Ser Gly Gly Tyr Ala Glu His
305                               310                               315                               320
Ile Phe Lys Tyr Ala Ala Lys His Ile Phe Asn Glu Asp Leu Lys Thr
325                               330                               335
Glu Leu Glu Phe Lys Gln Leu Lys Asn Arg Asp Phe Arg Glu Ile Ile
340                               345                               350
Leu Lys Gln Asn Gly Lys Thr Val Leu Lys Phe Ala Ile Ala Asn Gly
355                               360                               365
Phe Arg Asn Ile Gln Asn Leu Val Gln Lys Leu Lys Arg Glu Lys Val
370                               375                               380
Ser Asn Tyr His Phe Val Glu Val Met Ala Cys Pro Ser Gly Cys Ile
385                               390                               395                               400

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060513 second sequence listing formatted.txt

Asn Gly Gly Ala Gln Ile Arg Pro Thr Thr Gly Gln His Val Arg Glu
405 410 415

Leu Thr Arg Lys Leu Glu Glu Leu Tyr Gln Asn Leu Pro Arg Ser Glu
420 425 430

Pro Glu Asn Ser Leu Thr Lys His Ile Tyr Asn Asp Phe Leu Asp Gly
435 440 445

Phe Gln Ser Asp Lys Ser Tyr Asp Val Leu His Thr Arg Tyr His Asp
450 455 460

Val Val Ser Glu Leu Ser Ile Ser Leu Asn Ile Asn Trp
465 470 475

<210> 58
<211> 538
<212> PRT
<213> S. pombe

<400> 58

Met Ala Lys Leu Ser Val Asn Asp Leu Asn Asp Phe Leu Ser Pro Gly
1 5 10 15

Ala Val Cys Ile Lys Pro Ala Gln Val Lys Lys Gln Glu Ser Lys Asn
20 25 30

Asp Ile Arg Ile Asp Gly Asp Ala Tyr Tyr Glu Val Thr Lys Asp Thr
35 40 45

Gly Glu Thr Ser Glu Leu Gly Ile Ala Ser Ile Ser Leu Asn Asp Cys
50 55 60

Leu Ala Cys Ser Gly Cys Ile Thr Ser Ala Glu Thr Val Leu Val Asn
65 70 75 80

Leu Gln Ser Tyr Gln Glu Val Leu Lys His Leu Glu Ser Arg Lys Ser
85 90 95

Gln Glu Ile Leu Tyr Val Ser Leu Ser Pro Gln Val Arg Ala Asn Leu
100 105 110

Ala Ala Tyr Tyr Gly Leu Ser Leu Gln Glu Ile Gln Ala Val Leu Glu
115 120 125

Met Val Phe Ile Gly Lys Leu Gly Phe His Ala Ile Leu Asp Thr Asn
130 135 140

Ala Ser Arg Glu Ile Val Leu Gln Gln Cys Ala Gln Glu Phe Cys Asn
145 150 155 160

Ser Trp Leu Gln Ser Arg Ala His Lys Asn Gln Asn Gln Val Thr Asn
165 170 175

060513 second sequence listing formatted.txt

Ser Val Val Asn Glu His Pro Leu Ile Pro His Ser Thr Ser Gln Ile
180 185 190

Ser Gly Val His Ser Asn Thr Ser Ser Asn Ser Gly Ile Asn Glu Asn
195 200 205

Ala Val Leu Pro Ile Leu Ser Ser Ser Cys Pro Gly Trp Ile Cys Tyr
210 215 220

Val Glu Lys Thr His Ser Asn Leu Ile Pro Asn Leu Ser Arg Val Arg
225 230 235 240

Ser Pro Gln Gln Ala Cys Gly Arg Ile Leu Lys Asp Trp Ala Val Gln
245 250 255

Gln Phe Ser Met Gln Arg Asn Asp Val Trp His Leu Ser Leu Met Pro
260 265 270

Cys Phe Asp Lys Lys Leu Glu Ala Ser Arg Asp Glu Phe Ser Glu Asn
275 280 285

Gly Val Arg Asp Val Asp Ser Val Leu Thr Pro Lys Glu Leu Val Glu
290 295 300

Met Phe Lys Phe Leu Arg Ile Asp Pro Ile Glu Leu Thr Lys Asn Pro
305 310 315 320

Ile Pro Phe Gln Gln Ser Thr Asp Ala Ile Pro Phe Trp Tyr Pro Arg
325 330 335

Ile Thr Tyr Glu Glu Gln Ile Gly Ser Ser Ser Gly Gly Tyr Met Gly
340 345 350

Tyr Val Leu Ser Tyr Ala Ala Lys Met Leu Phe Gly Ile Asp Asp Val
355 360 365

Gly Pro Tyr Val Ser Met Asn Asn Lys Asn Gly Asp Leu Thr Glu Tyr
370 375 380

Thr Leu Arg His Pro Glu Thr Asn Glu Gln Leu Ile Ser Met Ala Thr
385 390 395 400

Cys Tyr Gly Phe Arg Asn Ile Gln Asn Leu Val Arg Arg Val His Gly
405 410 415

Asn Ser Ser Val Arg Lys Gly Arg Val Leu Leu Lys Lys Arg Val Arg
420 425 430

Ser Asn Ala Gln Asn Pro Thr Glu Glu Pro Ser Arg Tyr Asp Tyr Val
435 440 445

Glu Val Met Ala Cys Pro Gly Gly Cys Ile Asn Gly Gly Gly Gln Leu
 450 455 460

Pro Phe Pro Ser Val Glu Arg Ile Val Ser Ala Arg Asp Trp Met Gln
 465 470 475 480

Gln Val Glu Lys Leu Tyr Tyr Glu Pro Gly Thr Arg Ser Val Asp Gln
 485 490 495

Ser Ala Val Ser Tyr Met Leu Glu Gln Trp Val Lys Asp Pro Thr Leu
 500 505 510

Thr Pro Lys Phe Leu His Thr Ser Tyr Arg Ala Val Gln Thr Asp Asn
 515 520 525

Asp Asn Pro Leu Leu Leu Ala Asn Lys Trp
 530 535

<210> 59
 <211> 119
 <212> PRT
 <213> Metopus contortus

<400> 59

Ile Ile Phe Ala Glu Lys Asn Tyr Pro Glu Met Val Asn His Leu Ser
 1 5 10 15

Thr Thr Lys Ser Pro Met Gln Met Leu Ser Ser Leu Ser Lys Gly Tyr
 20 25 30

Trp Ala Lys Glu Gly Lys Lys Ile Asp Pro Lys Asn Val Val Asn Val
 35 40 45

Ala Ile Met Pro Cys Thr Ala Lys Lys Ala Trp Lys Glu Arg Pro Asp
 50 55 60

Met Lys Ala Asp Asn Gly Asp Pro Val Thr Asp Tyr Val Leu Thr Thr
 65 70 75 80

Arg Glu Leu Gly Thr Met Leu Arg Gln Ser Asn Ile Asn Pro Val Ser
 85 90 95

Leu Pro Lys Thr Pro Phe Asp Lys Ile Met Gly Glu Ser Thr Gly Ala
 100 105 110

Ala Val Ile Phe Gly Ala Thr
 115

<210> 60
 <211> 462
 <212> PRT
 <213> Mus musculus

<400> 60

Met Lys Cys Glu His Cys Thr Arg Lys Glu Cys Ser Lys Lys Ser Lys
 1 5 10 15
 Asn Asp Asp Gln Glu Asn Val Ser Ser Asp Gly Ala Gln Pro Ser Asp
 20 25 30
 Gly Ala Ser Pro Ala Lys Glu Ser Glu Glu Lys Gly Glu Phe His Lys
 35 40 45
 Leu Ala Asp Ala Lys Ile Phe Leu Ser Asp Cys Leu Ala Cys Asp Ser
 50 55 60
 Cys Val Thr Val Glu Glu Gly Val Gln Leu Ser Gln Gln Ser Ala Lys
 65 70 75 80
 Asp Phe Leu His Val Leu Asn Leu Asn Lys Arg Cys Asp Thr Ser Lys
 85 90 95
 His Arg Val Leu Val Val Ser Val Cys Pro Gln Ser Leu Pro Tyr Phe
 100 105 110
 Ala Ala Lys Phe Asn Leu Ser Val Thr Asp Ala Ser Arg Arg Leu Cys
 115 120 125
 Gly Phe Leu Lys Ser Leu Gly Val His Tyr Val Phe Asp Thr Thr Ile
 130 135 140
 Ala Ala Asp Phe Ser Ile Leu Glu Ser Gln Lys Glu Phe Val Arg Arg
 145 150 155 160
 Tyr His Gln His Ser Glu Glu Gln Arg Glu Leu Pro Met Leu Thr Ser
 165 170 175
 Ala Cys Pro Gly Trp Val Arg Tyr Ala Glu Arg Val Leu Gly Arg Pro
 180 185 190
 Ile Ile Pro Tyr Leu Cys Thr Ala Lys Ser Pro Gln Gln Val Met Gly
 195 200 205
 Ser Leu Val Lys Asp Tyr Phe Ala Arg Gln Gln Asn Leu Ser Pro Glu
 210 215 220
 Lys Ile Phe His Val Val Val Ala Pro Cys Tyr Asp Lys Lys Leu Glu
 225 230 235 240
 Ala Leu Arg Glu Gly Leu Ser Thr Thr Leu Asn Gly Ala Arg Gly Thr
 245 250 255
 Asp Cys Val Leu Thr Ser Gly Glu Ile Ala Gln Ile Met Glu Gln Ser
 260 265 270
 Asp Leu Ser Val Lys Asp Ile Ala Val Asp Thr Leu Phe Gly Asp Met
 275 280 285

Lys Glu Val Ala Val Gln Arg His Asp Gly Val Ser Ser Asp Gly His
290 295 300

Leu Ala His Val Phe Arg His Ala Ala Lys Glu Leu Phe Gly Glu His
305 310 315 320

Val Glu Glu Ile Thr Tyr Arg Ala Leu Arg Asn Lys Asp Phe His Glu
325 330 335

Val Thr Leu Glu Lys Asn Gly Glu Val Leu Leu Arg Phe Ala Ala Ala
340 345 350

Tyr Gly Phe Arg Asn Ile Gln Asn Met Ile Gln Lys Leu Lys Lys Gly
355 360 365

Lys Leu Pro Tyr His Phe Val Glu Val Leu Ala Cys Pro Arg Gly Cys
370 375 380

Leu Asn Gly Arg Gly Gln Ala Gln Thr Glu Asp Gly His Thr Asp Arg
385 390 395 400

Ala Leu Leu Gln Gln Met Glu Gly Ile Tyr Ser Gly Ile Pro Val Arg
405 410 415

Pro Pro Glu Ser Ser Thr His Val Gln Glu Leu Tyr Gln Glu Trp Leu
420 425 430

Glu Gly Thr Glu Ser Pro Lys Val Gln Glu Val Leu His Thr Ser Tyr
435 440 445

Gln Ser Leu Glu Pro Cys Thr Asp Gly Leu Asp Ile Lys Trp
450 455 460

<210> 61
<211> 457
<212> PRT
<213> Caenorhabditis elegans

<400> 61

Met Glu Asp Ser Gly Phe Ser Gly Val Val Arg Leu Ser Asn Val Ser
1 5 10 15

Asp Phe Ile Ala Pro Asn Leu Asp Cys Ile Ile Pro Leu Glu Thr Arg
20 25 30

Thr Val Glu Lys Lys Lys Glu Glu Ser Gln Val Asn Ile Arg Thr Lys
35 40 45

Lys Pro Lys Asp Lys Glu Ser Ser Lys Thr Glu Glu Lys Lys Ser Val
50 55 60

Lys Ile Ser Leu Ala Asp Cys Leu Ala Cys Ser Gly Cys Ile Thr Ser
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Ala	Glu	Thr	Val	Leu 85	Val	Glu	Glu	Gln	Ser 90	Phe	Gly	Arg	Val	Tyr 95	Glu
Gly	Ile	Gln	Asn 100	Ser	Lys	Leu	Ser	Val 105	Val	Thr	Val	Ser	Pro 110	Gln	Ala
Ile	Thr	Ser 115	Ile	Ala	Val	Lys	Ile 120	Gly	Lys	Ser	Thr	Asn 125	Glu	Val	Ala
Lys	Ile 130	Ile	Ala	Ser	Phe	Phe 135	Arg	Arg	Leu	Gly	Val 140	Lys	Tyr	Val	Ile
Asp 145	Ser	Ser	Phe	Ala	Arg 150	Lys	Phe	Ala	His	Ser 155	Leu	Ile	Tyr	Glu	Glu 160
Leu	Ser	Thr	Thr	Pro 165	Ser	Thr	Ser	Arg	Pro 170	Leu	Leu	Ser	Ser	Ala 175	Cys
Pro	Gly	Phe	Val 180	Cys	Tyr	Ala	Glu	Lys 185	Ser	His	Gly	Glu	Leu 190	Leu	Ile
Pro	Lys	Ile 195	Ser	Lys	Ile	Arg	Ser 200	Pro	Gln	Ala	Ile	Ser 205	Gly	Ala	Ile
Ile	Lys 210	Gly	Phe	Leu	Ala	Lys 215	Arg	Glu	Gly	Leu	Ser 220	Pro	Cys	Asp	Val
Phe 225	His	Ala	Ala	Val	Met 230	Pro	Cys	Phe	Asp	Lys 235	Lys	Leu	Glu	Ala	Ser 240
Arg	Glu	Gln	Phe	Lys 245	Val	Asp	Gly	Thr	Asp 250	Val	Arg	Glu	Thr	Asp 255	Cys
Val	Ile	Ser	Thr 260	Ala	Glu	Leu	Leu	Glu 265	Glu	Ile	Ile	Lys	Leu 270	Glu	Asn
Asp	Glu	Ala 275	Gly	Asp	Val	Glu	Asn 280	Arg	Ser	Glu	Glu	Glu 285	Gln	Trp	Leu
Ser	Ala 290	Leu	Ser	Lys	Gly	Ser 295	Val	Ile	Gly	Asp	Asp 300	Gly	Gly	Ala	Ser
Gly 305	Gly	Tyr	Ala	Asp	Arg 310	Ile	Val	Arg	Asp	Phe 315	Val	Leu	Glu	Asn	Gly 320
Gly	Gly	Ile	Val	Lys 325	Thr	Ser	Lys	Leu	Asn 330	Lys	Asn	Met	Phe	Ser 335	Thr
Thr	Val	Glu	Ser 340	Glu	Ala	Gly	Glu	Ile 345	Leu	Leu	Arg	Val	Ala 350	Lys	Val

060513 second sequence listing formatted.txt

Tyr Gly Phe Arg Asn Val Gln Asn Leu Val Arg Lys Met Lys Thr Lys
 355 360 365
 Lys Glu Lys Thr Asp Tyr Val Glu Ile Met Ala Cys Pro Gly Gly Cys
 370 375 380
 Ala Asn Gly Gly Gly Gln Ile Arg Tyr Glu Thr Met Asp Glu Arg Glu
 385 390 395 400
 Glu Lys Leu Ile Lys Val Glu Ala Leu Tyr Glu Asp Leu Pro Arg Gln
 405 410 415
 Asp Asp Glu Glu Thr Trp Ile Lys Val Arg Glu Glu Trp Glu Lys Leu
 420 425 430
 Asp Lys Asn Tyr Arg Asn Leu Leu Phe Thr Asp Tyr Arg Pro Val Glu
 435 440 445
 Thr Asn Val Ala Gln Val Leu Lys Trp
 450 455
 <210> 62
 <211> 462
 <212> PRT
 <213> Mus musculus
 <400> 62
 Met Lys Cys Glu His Cys Thr Arg Lys Glu Cys Ser Lys Lys Ser Lys
 1 5 10 15
 Thr Asp Asp Gln Glu Asn Val Ser Ser Asp Gly Ala Gln Pro Ser Asp
 20 25 30
 Gly Ala Ser Pro Ala Lys Glu Ser Glu Glu Lys Gly Glu Phe His Lys
 35 40 45
 Leu Ala Asp Ala Lys Ile Phe Leu Ser Asp Cys Leu Ala Cys Asp Ser
 50 55 60
 Cys Val Thr Val Glu Glu Gly Val Gln Leu Ser Gln Gln Ser Ala Lys
 65 70 75 80
 Asp Phe Leu His Val Leu Asn Leu Asn Lys Arg Cys Asp Thr Ser Lys
 85 90 95
 His Arg Val Leu Val Val Ser Val Cys Pro Gln Ser Leu Pro Tyr Phe
 100 105 110
 Ala Ala Lys Phe Asn Leu Ser Val Thr Asp Ala Ser Arg Arg Leu Cys
 115 120 125
 Gly Phe Leu Lys Ser Leu Gly Val His Tyr Val Phe Asp Thr Thr Ile
 130 135 140

060513 second sequence listing formatted.txt

Ala Ala Asp Phe Ser Ile Leu Glu Ser Gln Lys Glu Phe Val Arg Arg
 145 150 155 160
 Tyr His Gln His Ser Glu Glu Gln Arg Glu Leu Pro Met Leu Thr Ser
 165 170 175
 Ala Cys Pro Gly Trp Val Arg Tyr Ala Glu Arg Val Leu Gly Arg Pro
 180 185 190
 Ile Ile Pro Tyr Leu Cys Thr Ala Lys Ser Pro Gln Gln Val Met Gly
 195 200 205
 Ser Leu Val Lys Asp Tyr Phe Ala Arg Gln Gln Asn Leu Ser Pro Glu
 210 215 220
 Lys Ile Phe His Val Val Val Ala Pro Cys Tyr Asp Lys Lys Leu Glu
 225 230 235 240
 Ala Leu Arg Glu Gly Leu Ser Thr Thr Leu Asn Gly Ala Arg Gly Thr
 245 250 255
 Asp Cys Val Leu Thr Ser Gly Glu Ile Ala Gln Ile Met Glu Gln Ser
 260 265 270
 Asp Leu Ser Val Lys Asp Ile Ala Val Asp Thr Leu Phe Gly Asp Met
 275 280 285
 Lys Glu Val Ala Val Gln Arg His Asp Gly Val Ser Ser Asp Gly His
 290 295 300
 Leu Ala His Val Phe Arg His Ala Ala Lys Glu Leu Phe Gly Glu His
 305 310 315 320
 Val Glu Glu Ile Thr Tyr Arg Ala Leu Arg Asn Lys Asp Phe His Glu
 325 330 335
 Val Thr Leu Glu Lys Asn Gly Glu Val Leu Leu Arg Phe Ala Ala Ala
 340 345 350
 Tyr Gly Phe Arg Asn Ile Gln Asn Met Ile Gln Lys Leu Lys Lys Gly
 355 360 365
 Lys Leu Pro Tyr His Phe Val Glu Val Leu Ala Cys Pro Arg Gly Cys
 370 375 380
 Leu Asn Gly Arg Gly Gln Ala Gln Thr Glu Asp Gly His Thr Asp Arg
 385 390 395 400
 Ala Leu Leu Gln Gln Met Glu Gly Ile Tyr Ser Gly Ile Pro Val Arg
 405 410 415

Pro Pro Glu Ser Ser Thr His Val Gln Glu Leu Tyr Gln Glu Trp Leu
 420 425 430

Glu Gly Thr Glu Ser Pro Lys Val Gln Glu Val Leu His Thr Ser Tyr
 435 440 445

Gln Ser Leu Glu Pro Cys Thr Asp Gly Leu Asp Ile Lys Trp
 450 455 460

<210> 63
 <211> 119
 <212> PRT
 <213> Neocallimastix

<400> 63

Ile Met Phe Ala Glu Lys Asn Phe Pro Asp Met Val Asn Asn Leu Ser
 1 5 10 15

Thr Thr Lys Ser Pro Met Gln Met Leu Ser Ser Leu Thr Lys Gly Tyr
 20 25 30

Trp Ala Lys Asp Ile Lys Lys Ile Asn Pro Lys Asp Val Val Asn Val
 35 40 45

Ala Ile Met Pro Cys Thr Ala Lys Lys Gln Glu Lys Asp Arg Pro Gly
 50 55 60

Met Lys Thr Asp Glu Gly Asp Lys Val Thr Asp Phe Val Leu Thr Thr
 65 70 75 80

Arg Glu Leu Gly Met Met Leu Arg Gln Ala Asn Ile Asp Pro Thr Lys
 85 90 95

Leu Pro Gly Thr Lys Phe Asp Lys Val Met Gly Glu Ser Thr Gly Ala
 100 105 110

Ala Val Ile Phe Gly Ala Thr
 115

<210> 64
 <211> 119
 <212> PRT
 <213> Nyctotherus ovalis

<400> 64

Ile Ile Phe Met Glu Lys Asn Tyr Pro Asp Met Leu Ser His Leu Ser
 1 5 10 15

Thr Cys Lys Ser Pro Gln Gly Met Leu Gly Ala Leu Ile Lys Gly Tyr
 20 25 30

Trp Ala Lys Lys Val Lys Lys Val Asp Pro Lys Asp Val Val Ser Val
 35 40 45

Ser Ile Met Pro Cys Thr Ala Lys Lys Ala Glu Lys Glu Arg Pro Gln
 50 55 60

Leu Arg Gly Asp Glu Gly Phe Lys Asp Val Asp Tyr Val Leu Thr Thr
 65 70 75 80

Arg Glu Leu Ala Lys Met Leu Lys Gln Ser Asn Ile Asp Leu Gly Lys
 85 90 95

Val Glu Pro Thr Pro Phe Asp Ala Val Met Ser Glu Gly Thr Gly Ala
 100 105 110

Ala Val Ile Phe Gly Val Thr
 115

<210> 65
 <211> 490
 <212> PRT
 <213> Clostridium perfringens

<400> 65

Met Ala Ile Lys Asp Ala Asn Lys Gln Tyr Ile Lys Phe Asp Thr Ala
 1 5 10 15

Val Gln Val Leu Lys Tyr Glu Val Leu Lys Arg Ile Ala Glu Lys Glu
 20 25 30

Phe Asp Gly Thr Leu Asp Lys Glu Lys Leu Asn Ile Ala Lys Glu Ile
 35 40 45

Val Asp Asp Leu Lys Pro Asn Val Arg Cys Cys Ile Tyr Lys Glu Arg
 50 55 60

Ala Ile Val Glu Glu Arg Met Lys Leu Ala Leu Gly Gly His Glu Asn
 65 70 75 80

Arg Glu Asn Met Ile Glu Val Ile Asp Ile Ala Cys Asp Glu Cys Pro
 85 90 95

Val Asn Arg Phe Ile Val Thr Asp Ala Cys Arg Gly Cys Leu Ala Lys
 100 105 110

Lys Cys Arg Asp Ser Cys Asn Phe Gly Ala Ile Ser Phe Asp Asn Arg
 115 120 125

Lys Cys Lys Ile Asp Tyr Glu Lys Cys Lys Glu Cys Gly Lys Cys Lys
 130 135 140

Glu Val Cys Pro Tyr Asn Ala Ile Ala Glu Val Lys Arg Pro Cys Met
 145 150 155 160

Arg Ala Cys Ile Pro Lys Ala Leu Ser Tyr Asp Val Asp Ser Lys Lys
 165 170 175

060513 second sequence listing formatted.txt

Ala Val Ile Asp Asp Ser Lys Cys Ile Gln Cys Gly Ala Cys Val Val
180 185 190

Asp Cys Pro Phe Gly Ala Ile Met Asp Lys Ser Tyr Leu Val Asp Val
195 200 205

Ile Arg Leu Leu Lys Asp Glu Lys Lys Val Tyr Ala Ile Val Ala Pro
210 215 220

Ala Ile Ser Ser Gln Phe Asn His Ser Lys Ile Gly Lys Val Ile Thr
225 230 235 240

Ala Ile Lys Lys Leu Gly Phe Glu Asp Val Phe Glu Ala Ala Leu Gly
245 250 255

Ala Asp Leu Val Ala Val His Glu Cys Asn Glu Phe Lys Glu Lys Gly
260 265 270

Glu Leu Asp Phe Met Thr Thr Ser Cys Cys Pro Ala Phe Val Ser Tyr
275 280 285

Ile Glu Lys Asn Tyr Pro Glu Leu Lys Glu Cys Ile Ser Asn Thr Val
290 295 300

Ser Pro Met Val Ala Met Ala Arg Leu Ile Lys Ser Gln Asn Lys Asp
305 310 315 320

Val Lys Thr Val Phe Ile Gly Pro Cys Ile Ala Lys Lys Thr Glu Ala
325 330 335

Lys Arg Asn Glu Val Ser Gly Asp Val Asp Tyr Val Leu Thr Phe Glu
340 345 350

Glu Leu Leu Ala Leu Leu Asp Ser Arg Asn Ile Lys Ile Asp Glu Cys
355 360 365

Glu Glu Ser Asp Thr Lys His Gly Ser Phe Tyr Gly Arg Leu Phe Ala
370 375 380

Arg Ser Gly Gly Val Thr Glu Ser Val Lys His Leu Ile Asp Ser Glu
385 390 395 400

Gly Ile Lys Val Asp Phe Arg Pro Ile Leu Gly Asp Gly Ile Lys Asp
405 410 415

Cys Asp Ile Lys Leu Arg Leu Ala Lys Leu Lys Arg Ala Gln Gly Asn
420 425 430

Phe Leu Glu Gly Met Ala Cys Lys Gly Gly Cys Ile Asn Gly Pro Gly
435 440 445

Ser Leu Asn His Asp Ile Lys Asn Ser Lys Glu Val Asp Lys Tyr Gly

450

455

460

Glu Leu Ser Ser Ser Glu Lys Ile Lys Asp Thr Leu Ala Asp Ile Lys
 465 470 475 480

Phe Glu Asp Leu Asn Leu Ser Lys Asn Glu
 485 490

<210> 66
 <211> 456
 <212> PRT
 <213> Homo sapiens
 <400> 66

Met Lys Cys Glu His Cys Thr Arg Lys Glu Cys Ser Lys Lys Thr Lys
 1 5 10 15

Thr Asp Asp Gln Glu Asn Val Ser Ala Asp Ala Pro Ser Pro Ala Gln
 20 25 30

Glu Asn Gly Glu Lys Gly Glu Phe His Lys Leu Ala Asp Ala Lys Ile
 35 40 45

Phe Leu Ser Asp Cys Leu Ala Cys Asp Ser Cys Met Thr Ala Glu Glu
 50 55 60

Gly Val Gln Leu Ser Gln Gln Asn Ala Lys Asp Phe Phe Arg Val Leu
 65 70 75 80

Asn Leu Asn Lys Lys Cys Asp Thr Ser Lys His Lys Val Leu Val Val
 85 90 95

Ser Val Cys Pro Gln Ser Leu Pro Tyr Phe Ala Ala Lys Phe Asn Leu
 100 105 110

Ser Val Thr Asp Ala Ser Arg Arg Leu Cys Gly Phe Leu Lys Ser Leu
 115 120 125

Gly Val His Tyr Val Phe Asp Thr Thr Ile Ala Ala Asp Phe Ser Ile
 130 135 140

Leu Glu Ser Gln Lys Glu Phe Val Arg Arg Tyr Arg Gln His Ser Glu
 145 150 155 160

Glu Glu Arg Thr Leu Pro Met Leu Thr Ser Ala Cys Pro Gly Trp Val
 165 170 175

Arg Tyr Ala Glu Arg Val Leu Gly Arg Pro Ile Thr Ala His Leu Cys
 180 185 190

Thr Ala Lys Ser Pro Gln Gln Val Met Gly Ser Leu Val Lys Asp Tyr
 195 200 205

060513 second sequence listing formatted.txt

Phe Ala Arg Gln Gln Asn Leu Ser Pro Glu Lys Ile Phe His Val Ile
 210 215 220

Val Ala Pro Cys Tyr Asp Lys Lys Leu Glu Ala Leu Gln Glu Ser Leu
 225 230 235 240

Pro Pro Ala Leu His Gly Ser Arg Gly Ala Asp Cys Val Leu Thr Ser
 245 250 255

Gly Glu Ile Ala Gln Ile Met Glu Gln Gly Asp Leu Ser Val Arg Asp
 260 265 270

Ala Ala Val Asp Thr Leu Phe Gly Asp Leu Lys Glu Asp Lys Val Thr
 275 280 285

Arg His Asp Gly Ala Ser Ser Asp Gly His Leu Ala His Ile Phe Arg
 290 295 300

His Ala Ala Lys Glu Leu Phe Asn Glu Asp Val Glu Glu Val Thr Tyr
 305 310 315 320

Arg Ala Leu Arg Asn Lys Asp Phe Gln Glu Val Thr Leu Glu Lys Asn
 325 330 335

Gly Glu Val Val Leu Arg Phe Ala Ala Tyr Gly Phe Arg Asn Ile
 340 345 350

Gln Asn Met Ile Leu Lys Leu Lys Lys Gly Lys Phe Pro Phe His Phe
 355 360 365

Val Glu Val Leu Ala Cys Ala Gly Gly Cys Leu Asn Gly Arg Gly Gln
 370 375 380

Ala Gln Thr Pro Asp Gly His Ala Asp Lys Ala Leu Leu Arg Gln Met
 385 390 395 400

Glu Gly Ile Tyr Ala Asp Ile Pro Val Arg Arg Pro Glu Ser Ser Ala
 405 410 415

His Val Gln Glu Leu Tyr Gln Glu Trp Leu Glu Gly Ile Asn Ser Pro
 420 425 430

Lys Ala Arg Glu Val Leu His Thr Thr Tyr Gln Ser Gln Glu Arg Gly
 435 440 445

Thr His Ser Leu Asp Ile Lys Trp
 450 455

<210> 67
 <211> 408
 <212> PRT
 <213> Homo sapiens
 <400> 67

060513 second sequence listing formatted.txt

Met Lys Cys Glu His Cys Thr Arg Lys Glu Cys Ser Lys Lys Thr Lys
1 5 10 15

Thr Asp Asp Gln Glu Asn Val Ser Ala Asp Ala Pro Ser Pro Ala Gln
20 25 30

Glu Asn Gly Glu Lys Cys Asp Thr Ser Lys His Lys Val Leu Val Val
35 40 45

Ser Val Cys Pro Gln Ser Leu Pro Tyr Phe Ala Ala Lys Phe Asn Leu
50 55 60

Ser Val Thr Asp Ala Ser Arg Arg Leu Cys Gly Phe Leu Lys Ser Leu
65 70 75 80

Gly Val His Tyr Val Phe Asp Thr Thr Ile Ala Ala Asp Phe Ser Ile
85 90 95

Leu Glu Ser Gln Lys Glu Phe Val Arg Arg Tyr Arg Gln His Ser Glu
100 105 110

Glu Glu Arg Thr Leu Pro Met Leu Thr Ser Ala Cys Pro Gly Trp Val
115 120 125

Arg Tyr Ala Glu Arg Val Leu Gly Arg Pro Ile Thr Ala His Leu Cys
130 135 140

Thr Ala Lys Ser Pro Gln Gln Val Met Gly Ser Leu Val Lys Asp Tyr
145 150 155 160

Phe Ala Arg Gln Gln Asn Leu Ser Pro Glu Lys Ile Phe His Val Ile
165 170 175

Val Ala Pro Cys Tyr Asp Lys Lys Leu Glu Ala Leu Gln Glu Ser Leu
180 185 190

Pro Pro Ala Leu His Gly Ser Arg Gly Ala Asp Cys Val Leu Thr Ser
195 200 205

Gly Glu Ile Ala Gln Ile Met Glu Gln Gly Asp Leu Ser Val Arg Asp
210 215 220

Ala Ala Val Asp Thr Leu Phe Gly Asp Leu Lys Glu Asp Lys Val Thr
225 230 235 240

Arg His Asp Gly Ala Ser Ser Asp Gly His Leu Ala His Ile Phe Arg
245 250 255

His Ala Ala Lys Glu Leu Phe Asn Glu Asp Val Glu Glu Val Thr Tyr
260 265 270

Arg Ala Leu Arg Asn Lys Asp Phe Gln Glu Val Thr Leu Glu Lys Asn

275

280

285

Gly Glu Val Val Leu Arg Phe Ala Ala Ala Tyr Gly Phe Arg Asn Ile
 290 295 300

Gln Asn Met Ile Leu Lys Leu Lys Lys Gly Lys Phe Pro Phe His Phe
 305 310 315 320

Val Glu Val Leu Ala Cys Ala Gly Gly Cys Leu Asn Gly Arg Gly Gln
 325 330 335

Ala Gln Thr Pro Asp Gly His Ala Asp Lys Ala Leu Leu Arg Gln Met
 340 345 350

Glu Gly Ile Tyr Ala Asp Ile Pro Val Arg Arg Pro Glu Ser Ser Ala
 355 360 365

His Val Gln Glu Leu Tyr Gln Glu Trp Leu Glu Gly Ile Asn Ser Pro
 370 375 380

Lys Ala Arg Glu Val Leu His Thr Thr Tyr Gln Ser Gln Glu Arg Gly
 385 390 395 400

Thr His Ser Leu Asp Ile Lys Trp
 405

<210> 68
 <211> 502
 <212> PRT
 <213> Homo sapiens

<400> 68

Met Lys Cys Glu His Cys Thr Arg Lys Glu Cys Ser Lys Lys Thr Lys
 1 5 10 15

Thr Asp Asp Gln Glu Asn Val Ser Ala Asp Ala Pro Ser Pro Ala Gln
 20 25 30

Glu Asn Gly Glu Lys Gly Glu Phe His Lys Leu Ala Asp Ala Lys Ile
 35 40 45

Phe Leu Ser Asp Cys Leu Ala Cys Asp Ser Cys Met Thr Ala Glu Glu
 50 55 60

Gly Val Gln Leu Ser Gln Gln Asn Ala Lys Asp Phe Phe Arg Val Leu
 65 70 75 80

Asn Leu Asn Lys Lys Cys Asp Thr Ser Lys His Lys Val Leu Val Val
 85 90 95

Ser Val Cys Pro Gln Ser Leu Pro Tyr Phe Ala Ala Lys Phe Asn Leu
 100 105 110

Ser Val Thr Asp Ala Ser Arg Arg Leu Cys Gly Phe Leu Lys Ser Leu
 115 120 125

Gly Val His Tyr Val Phe Asp Thr Thr Ile Ala Ala Asp Phe Ser Ile
 130 135 140

Leu Glu Ser Gln Lys Glu Phe Val Arg Arg Tyr Arg Gln His Ser Glu
 145 150 155 160

Glu Glu Arg Thr Leu Pro Met Leu Thr Ser Ala Cys Pro Gly Trp Val
 165 170 175

Arg Tyr Ala Glu Arg Val Leu Gly Arg Pro Ile Thr Ala His Leu Cys
 180 185 190

Thr Ala Lys Ser Pro Gln Gln Val Met Gly Ser Leu Val Lys Asp Tyr
 195 200 205

Phe Ala Arg Gln Gln Asn Leu Ser Pro Glu Lys Ile Phe His Val Ile
 210 215 220

Val Ala Pro Cys Tyr Asp Lys Lys Leu Glu Ala Leu Gln Glu Ser Leu
 225 230 235 240

Pro Pro Ala Leu His Gly Ser Arg Gly Ala Asp Cys Val Leu Thr Ser
 245 250 255

Glu Ile Ser Gln Ala Trp Trp Cys Thr Pro Val Ile Thr Ala Thr Arg
 260 265 270

Glu Ala Ala Ala Arg Glu Ser Leu Glu Pro Gly Arg Gln Arg Leu Gln
 275 280 285

Arg Asp Lys Ile Ala Pro Leu Asp Ser Ser Leu Gly Gly Gly Gly Glu
 290 295 300

Ile Ala Gln Ile Met Glu Gln Gly Asp Leu Ser Val Arg Asp Ala Ala
 305 310 315 320

Val Asp Thr Leu Phe Gly Asp Leu Lys Glu Asp Lys Val Thr Arg His
 325 330 335

Asp Gly Ala Ser Ser Asp Gly His Leu Ala His Ile Phe Arg His Ala
 340 345 350

Ala Lys Glu Leu Phe Asn Glu Asp Val Glu Glu Val Thr Tyr Arg Ala
 355 360 365

Leu Arg Asn Lys Asp Phe Gln Glu Val Thr Leu Glu Lys Asn Gly Glu
 370 375 380

Val Val Leu Arg Phe Ala Ala Ala Tyr Gly Phe Arg Asn Ile Gln Asn
 385 390 395 400

060513 second sequence listing formatted.txt

Met Ile Leu Lys Leu Lys Lys Gly Lys Phe Pro Phe His Phe Val Glu
405 410 415

Val Leu Ala Cys Ala Gly Gly Cys Leu Asn Gly Arg Gly Gln Ala Gln
420 425 430

Thr Pro Asp Gly His Ala Asp Lys Ala Leu Leu Arg Gln Met Glu Gly
435 440 445

Ile Tyr Ala Asp Ile Pro Val Arg Arg Pro Glu Ser Ser Ala His Val
450 455 460

Gln Glu Leu Tyr Gln Glu Trp Leu Glu Gly Ile Asn Ser Pro Lys Ala
465 470 475 480

Arg Glu Val Leu His Thr Thr Tyr Gln Ser Gln Glu Arg Gly Thr His
485 490 495

Ser Leu Asp Ile Lys Trp
500

<210> 69
<211> 448
<212> PRT
<213> Clostridium tetani

<400> 69

Met His Asn Asp Tyr Arg Glu Ile Phe Lys Arg Leu Ser Lys Ser Tyr
1 5 10 15

Tyr Asp Asp Thr Phe Glu Lys Glu Val Glu Asn Ile Leu Ser Ser His
20 25 30

Ser Met Asp Arg Glu Lys Leu Ala Lys Ile Ile Ser Ile Leu Cys Gly
35 40 45

Val Asn Ile Glu His Ser Glu Asn Tyr Ile Ser Asn Leu Lys Asn Ala
50 55 60

Ile Lys Asn Tyr Thr Ala Ser Ala Glu Lys Val Val Thr Lys Leu Pro
65 70 75 80

Cys Ser Thr Gln Cys Ala Lys Asp Gly Asp Ile Ile Cys Glu Lys Ser
85 90 95

Cys Pro Val Asn Ala Ile Phe Arg Asp Pro Asn Asp Asn Asn Ile Tyr
100 105 110

Ile Asn Asp Glu Leu Cys Leu Asp Cys Gly Leu Cys Val Arg Asn Cys
115 120 125

Pro Ser Gly Ser Ile Leu Asp Lys Lys Glu Phe Ile Pro Leu Ala Glu

130

135

140

Leu Leu Lys Ser Glu Ser Ile Val Ile Ala Ala Val Ala Pro Ala Ile
 145 150 155 160

Met Gly Gln Phe Gly Glu Asn Thr Thr Ile Asn Gln Leu Arg Thr Ala
 165 170 175

Phe Lys Lys Leu Gly Phe Thr Asp Met Val Glu Val Ala Phe Phe Ala
 180 185 190

Asp Met Leu Thr Leu Lys Glu Ala Val Glu Tyr Asp His Phe Val Lys
 195 200 205

Asp Glu Gln Asp Phe Met Ile Thr Ser Cys Cys Cys Pro Met Trp Val
 210 215 220

Gly Met Leu Lys Lys Val Tyr Asn Asp Leu Val Lys Tyr Val Ser Pro
 225 230 235 240

Ser Val Ser Pro Met Ile Ala Ala Gly Arg Val Leu Lys Leu Leu Asn
 245 250 255

Pro Asn Cys Lys Val Val Phe Val Gly Pro Cys Ile Ala Lys Lys Ala
 260 265 270

Glu Ala Arg Glu Lys Asp Leu Leu Gly Asp Ile Asp Phe Val Leu Thr
 275 280 285

Phe Thr Glu Leu Arg Asp Ile Phe Asp Val Phe Asp Ile Gln Pro Glu
 290 295 300

Asn Leu Glu Glu Asp Phe Ser Ser Glu Tyr Ala Ser Lys Gly Gly Arg
 305 310 315 320

Leu Tyr Ala Arg Thr Gly Gly Val Ser Ile Ala Val Ser Glu Ala Ile
 325 330 335

Glu Lys Leu Phe Pro Asn Lys Tyr Lys Phe Leu Lys Thr Ile Gln Ala
 340 345 350

Asp Gly Val Lys Gly Cys Lys Ser Leu Leu Asp Lys Ile Lys Gln Glu
 355 360 365

Asp Ile Ser Ala Asn Phe Val Glu Gly Met Gly Cys Val Gly Gly Cys
 370 375 380

Val Gly Gly Pro Lys Val Ile Ile Asp Pro Ser Glu Gly Arg Asn Ala
 385 390 395 400

Val Asn Asn Phe Ala Glu Asn Ser Ser Ile Lys Val Ser Val Asp Ser
 405 410 415

060513 second sequence listing formatted.txt

Asn Cys Met Asn Asp Ile Leu Ser Lys Ile Asn Ile Asn Ser Val Glu
420 425 430

Asp Phe Lys Asp Lys Asp Lys Ile Ser Ile Phe Glu Arg Glu Phe Lys
435 440 445

<210> 70

<211> 459

<212> PRT

<213> Desulfovibrio desulfuricans

<400> 70

Met Tyr Phe Arg Thr Tyr Asp Asn Thr Ile Asn Phe Glu Ile Met Val
1 5 10 15

Arg Ile Ala Lys Ala Phe His Gly Asp Ser Phe Glu Glu Gln Val Ala
20 25 30

Arg Ile Pro Leu Glu Met Arg Pro Arg Lys Ala His Ser Ser Arg Cys
35 40 45

Cys Ile Tyr Arg Asp Arg Ala Ile Ile Arg Tyr Arg Cys Met Ala Met
50 55 60

Leu Gly Tyr Ala Ile Glu Asp Glu Thr Asp Glu Leu Thr Ser Leu Ser
65 70 75 80

Gln Tyr Ala Lys Gly Ala Leu Glu Arg Asp Ser Ile Gln Gly Ser Met
85 90 95

Leu Thr Phe Ile Asp Glu Ala Cys Asn Gly Cys Val Arg Thr His Tyr
100 105 110

Glu Ala Thr Ser Ala Cys Arg Gly Cys Leu Ala Glu Ala Cys Val Gln
115 120 125

His Cys Pro Lys Asp Ala Val Arg Ile Val Asp Gly Lys Ser Arg Ile
130 135 140

Asp Pro Asp Lys Cys Val Gln Cys Gly Lys Cys Met Asn Val Cys Pro
145 150 155 160

Tyr His Ala Ile Val Gln Ile Pro Ile Pro Cys Glu Glu Ser Cys Pro
165 170 175

Thr Gly Ala Ile Ser Lys Asp Glu Cys Gly Lys Gln Val Ile Asp Tyr
180 185 190

Asp Arg Cys Ile Phe Cys Gly Lys Cys Met Ala Ala Cys Pro Phe Ala
195 200 205

Ala Val Leu Glu Lys Ser Gln Met Ile Asp Val Leu Arg Arg Ile Arg
210 215 220

060513 second sequence listing formatted.txt

Glu Gly Arg Lys Val Val Ala Ile Val Ala Pro Ala Ile Ala Gly Gln
225 230 235 240

Val Gln Ala Pro Met Ser Arg Leu Ala Thr Ala Leu Arg Gln Leu Gly
245 250 255

Phe Ala Asp Val Ala Glu Val Ala Ser Gly Ala Asp Thr Thr Ala Arg
260 265 270

Leu Glu Ala Asp Glu Phe Val Glu Arg Met Glu His Gly Ala Ala Phe
275 280 285

Met Thr Ser Ser Cys Cys Pro Ala Tyr Thr Gln Leu Val Asp Lys His
290 295 300

Leu Pro Glu Leu Ala Pro Phe Val Ser Asp Thr Arg Thr Pro Met His
305 310 315 320

Tyr Thr Ala Ala Met Val Lys Asp His Asp Pro Asp Met Val Thr Val
325 330 335

Phe Ile Gly Pro Cys Val Ala Lys Arg Asn Glu Gly Lys His Asp Glu
340 345 350

Leu Val Asp His Val Leu Thr Phe Gln Glu Met Val Ala Met Leu Thr
355 360 365

Ala Ala Gly Ile Ser Val Asp Ala Cys Glu Asp Gly Arg Phe Met Phe
370 375 380

Pro Ala Met Arg Glu Gly Arg Ser Phe Pro Val Ser Gly Gly Val Thr
385 390 395 400

Ala Gly Val Gln Ala His Ile Gly Thr Arg Ala Glu Val Arg Pro Leu
405 410 415

Ser Val Asp Gly Leu Asn Lys Lys Thr Phe Arg Gln Leu Lys Thr Trp
420 425 430

Ala Lys Lys Gly Cys Glu Gly Asn Phe Val Glu Val Met Gly Cys Gln
435 440 445

Gly Gly Cys Val Ala Gly Pro Ala Ile Val Met
450 455

<210> 71
<211> 494
<212> PRT
<213> Clostridium tetani

<400> 71

Met Ile Val Phe Glu Asn Gln Leu Lys Lys Leu Lys Tyr Leu Val Leu

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1           5           10           15
Lys Glu Val Ala Lys Met Thr Leu Glu Asp Arg Leu Gly Glu Glu Asp
      20      25      30
Ile Glu Arg Ile Ser Phe Asp Ile Ile Lys Gly Asp Lys Ala Glu Tyr
      35      40      45
Arg Cys Cys Val Tyr Lys Glu Arg Ala Ile Val Tyr Glu Arg Ala Lys
      50      55      60
Leu Ala Thr Gly Cys Leu Pro Asn Gly Gln Val Ala Glu Glu Phe Val
      65      70      75      80
His Val Glu Asp Asp Asp Gln Ile Ile Tyr Val Ile Asp Ala Ala Cys
      85      90      95
Asp Lys Cys Pro Ile Asn Lys Tyr Val Val Thr Glu Ala Cys Arg Gly
      100      105      110
Cys Leu Gln His Lys Cys Met Glu Val Cys Pro Ala Gly Ser Ile Asn
      115      120      125
Arg Ala Ala Gly Lys Ala Tyr Ile Asn His Glu Thr Cys Lys Glu Cys
      130      135      140
Gly Leu Cys Glu Ser Ala Cys Pro Tyr Asn Ala Ile Ala Glu Val Met
      145      150      155      160
Arg Pro Cys Arg Arg Ala Cys Pro Thr Gly Ala Leu Gln Met Asn Leu
      165      170      175
Glu Asp Asn Lys Ala Thr Ile Asn Lys Glu Asp Cys Ile Asn Cys Gly
      180      185      190
Ser Cys Met Ser Val Cys Pro Phe Gly Ala Ile Ser Asp Lys Ser Tyr
      195      200      205
Ile Val Asp Ile Thr Lys Ala Leu Lys Asn Asn Lys Lys Val Tyr Ala
      210      215      220
Met Val Ala Pro Ala Ile Thr Gly Gln Phe Gly Lys Asp Val Ser Val
      225      230      235      240
Gly Lys Met Lys Asn Ala Phe Lys Ala Met Gly Phe Glu Asp Met Leu
      245      250      255
Glu Val Ala Cys Gly Ala Asp Ala Val Ala Ala His Glu Ser Glu Glu
      260      265      270
Phe Ile Glu Arg Leu Glu Ser Gly Lys Lys Tyr Met Thr Thr Ser Cys
      275      280      285

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060513 second sequence listing formatted.txt

Cys Pro Gly Phe Leu Gly Tyr Ile Glu Lys Lys Phe Pro Asp Gln Leu
 290 295 300
 Glu Asn Val Ser Asn Thr Val Ser Pro Met Val Ala Ile Gly Arg Met
 305 310 315 320
 Ile Lys Lys Glu Tyr Glu Asp Ser Val Val Val Phe Val Gly Pro Cys
 325 330 335
 Thr Ala Lys Lys Ala Glu Ile Lys Arg Lys Gly Ile Lys Asp Ala Val
 340 345 350
 Asp Tyr Val Met Thr Phe Glu Glu Ile Ala Ala Leu Met Gly Ala Phe
 355 360 365
 Glu Ile Asp Pro Ala Glu Cys Glu Glu Glu Asp Ile Asn Asp Gly Ser
 370 375 380
 Asn Tyr Gly Arg Gly Phe Ala Gln Gly Gly Gly Val Val Ser Ala Ile
 385 390 395 400
 Gln Asn Cys Ile Lys Asp Lys Glu Gly Ile Lys Phe Asn Pro Leu Arg
 405 410 415
 Val Ser Gly Pro Asp Gln Ile Lys Arg Ala Met Ile Met Ala Lys Val
 420 425 430
 Gly Lys Leu Ser Glu Asn Phe Ile Glu Gly Met Met Cys Glu Gly Gly
 435 440 445
 Cys Ile Gly Gly Pro Ala Thr Met Val Ser Ala Val Lys Ala Lys Ala
 450 455 460
 Pro Leu Met Lys Phe Ser Lys Ser Ser Thr Ile Lys Asp Val Lys Asp
 465 470 475 480
 Asn Glu Val Leu Asp Lys Tyr Lys Asp Ile Asn Met Glu Arg
 485 490
 <210> 72
 <211> 203
 <212> PRT
 <213> Arabidopsis thaliana
 <400> 72
 Met Asp Leu Ile Lys Leu Lys Gly Val Asp Phe Lys Asp Leu Glu Glu
 1 5 10 15
 Ser Pro Leu Asp Arg Val Leu Thr Asn Val Thr Glu Glu Gly Asp Leu
 20 25 30
 Tyr Gly Val Ala Gly Ser Ser Gly Gly Tyr Ala Glu Thr Ile Phe Arg
 35 40 45

060513 second sequence listing formatted.txt

His Ala Ala Lys Ala Leu Phe Gly Gln Thr Ile Glu Gly Pro Leu Glu
50 55 60

Phe Lys Thr Leu Arg Asn Ser Asp Phe Arg Glu Val Thr Leu Gln Leu
65 70 75 80

Glu Gly Lys Thr Val Leu Lys Phe Ala Leu Cys Tyr Gly Phe Gln Asn
85 90 95

Leu Gln Asn Ile Val Arg Arg Val Lys Thr Arg Lys Cys Asp Tyr Gln
100 105 110

Tyr Val Glu Ile Met Ala Cys Pro Ala Gly Cys Leu Asn Gly Gly Gly
115 120 125

Gln Ile Lys Pro Lys Thr Gly Gln Ser Gln Lys Glu Leu Ile His Ser
130 135 140

Leu Glu Ala Thr Tyr Met Asn Asp Thr Thr Leu Asn Thr Asp Pro Tyr
145 150 155 160

Gln Asn Pro Thr Ala Lys Arg Leu Phe Glu Glu Trp Leu Lys Glu Pro
165 170 175

Gly Ser Asn Glu Ala Lys Lys Tyr Leu His Thr Gln Tyr His Pro Val
180 185 190

Val Lys Ser Val Thr Ser Gln Leu Asn Asn Trp
195 200

<210> 73
<211> 449
<212> PRT
<213> Clostridium perfringens
<400> 73

Met Asn Lys Lys Tyr Asn Ser Leu Phe Lys Glu Leu Ile Ser Ser Tyr
1 5 10 15

Tyr Ser Glu Asp Asn Phe Asp Glu Lys Leu Asn Asp Ile Val Lys Asn
20 25 30

Asn Phe Asn Ser Lys Glu Asp Ala Ile Glu Val Leu Ser Ser Leu Cys
35 40 45

Gly Val Asp Ile Asp Lys Asn Ser Asp Asn Ile Ala Tyr Asp Ile Arg
50 55 60

Lys Ala Ile Thr Thr His Lys Ile Lys Lys Asn Ile Val Asp Lys Val
65 70 75 80

Ser Val Cys Thr Lys Asn Cys Ser Lys Glu Ser Lys Gly Lys Cys Gln
Page 127

Ser Leu Cys Pro Phe Asp Ala Ile Leu Thr Asp Pro Ile Asp Asn Ser
100 105 110

Lys Tyr Ile Asp Pro Asn Leu Cys Gln Asn Cys Gly Ile Cys Val Gln
115 120 125

Val Cys Glu Ser Gly His Phe Leu Asp Arg Ile Glu Leu Leu Pro Ile
130 135 140

Ile Asp Leu Ile Lys Asn Asn Glu Thr Val Ile Ala Ala Val Ala Pro
145 150 155 160

Ala Ile Ala Gly Gln Phe Gly Glu Asn Val Ser Leu Asp Met Leu Arg
165 170 175

Glu Ala Phe Ile Lys Ile Gly Phe Ser Asp Met Ile Glu Val Ala Phe
180 185 190

Ala Ala Asp Met Leu Ser Ile Lys Glu Ala Val Glu Phe Asn His His
195 200 205

Val Glu Lys Thr Gly Asp Ile Leu Ile Thr Ser Cys Cys Cys Pro Met
210 215 220

Trp Val Ala Met Leu Arg Lys Cys Tyr Lys Asp Leu Val Lys Asp Val
225 230 235 240

Ser Pro Ser Val Ser Pro Met Ile Ala Ala Gly Arg Val Ile Lys Lys
245 250 255

Leu Asn Lys Asp Ala Lys Val Val Phe Ile Gly Pro Cys Ile Ala Lys
260 265 270

Lys Ala Glu Ala Arg Glu Lys Asp Leu Val Gly Ala Ile Asp Tyr Val
275 280 285

Leu Thr Phe Glu Glu Leu Asn Gly Ile Phe Glu Ala Leu Lys Ile Asp
290 295 300

Pro Ser Ser Met Lys Gly Val Pro Ser Ile Glu Tyr Thr Ser Arg Gly
305 310 315 320

Gly Arg Leu Tyr Ala Arg Thr Gly Gly Val Ser Glu Ala Ile Asn Asp
325 330 335

Val Val Lys Glu Leu Tyr Pro Asp Lys Ala Lys Ile Phe Lys Ala Val
340 345 350

Gln Ala Asn Gly Val Lys Glu Cys Lys Glu Leu Leu Asn Lys Val Gln
355 360 365

Ser Gly Glu Leu Lys Ala Asn Phe Ile Glu Gly Met Gly Cys Val Gly
 370 375 380

Gly Cys Val Gly Gly Pro Lys Arg Ile Val Asp Pro Ser Ile Gly Lys
 385 390 395 400

Lys His Val Asp Glu Val Ala Tyr Asn Ser Pro Ile Lys Val Ala Thr
 405 410 415

His Ser His Thr Met Asp Glu Val Leu Leu Arg Leu Gly Ile Asn Ser
 420 425 430

Leu Lys Ser Phe Glu Asp Lys Glu Lys Ile Ser Ile Phe Glu Arg Glu
 435 440 445

Phe

<210> 74
 <211> 359
 <212> PRT
 <213> Desulfitobacterium hafniense

<400> 74

Met Ala Gln Ser Glu Ile Met Lys Ile Arg Arg Gln Val Leu Lys Ser
 1 5 10 15

Ala Leu Asp Trp Val Ser His Asp Gln Asn Arg Lys Asp Arg Ala Thr
 20 25 30

Leu Ala Arg Gln Ile Ile Pro Asp Gly Thr Pro Arg Tyr Arg Cys Cys
 35 40 45

Ile His Lys Glu Arg Ala Val Ile Glu Glu Arg Leu Lys Ala Val Leu
 50 55 60

Glu Pro Asp Glu Gly Pro Ile Val Arg Val Leu Lys Glu Gly Cys Asn
 65 70 75 80

Gly Cys Glu Met His Arg Tyr Ser Val Thr Asp His Cys Gln Asn Cys
 85 90 95

Val Gly His Phe Cys Phe Thr Asn Cys Pro Lys Lys Ala Ile Leu Phe
 100 105 110

Ile Asn Asn Lys Ala Phe Ile Asp Gln Thr Arg Cys Val Glu Cys Gly
 115 120 125

Leu Cys Ala Arg Asn Cys Pro Tyr His Ala Ile Ile Glu Tyr Arg Arg
 130 135 140

Pro Cys Glu Asp Ser Cys Pro Thr Lys Ala Ile Ser Val Arg Glu Asp
 145 150 155 160

Arg Ile Ala Ser Ile Ala Glu Ala His Cys Thr Ser Cys Gly Lys Cys
 165 170 175

Ile Ile Ser Cys Pro Phe Gly Ala Val Ala Glu Ser Ser Gln Leu Ile
 180 185 190

His Leu Phe Glu Ala Val Arg Asn Pro Glu His Lys Ile Tyr Ala Val
 195 200 205

Ile Ala Pro Ala Phe Val Gly Gln Phe Gly Arg Lys Val Ser Pro Gly
 210 215 220

Gln Val Lys Ser Ala Leu Leu Lys Leu Gly Phe Gln Asp Val Leu Glu
 225 230 235 240

Ala Ala Leu Gly Ala Asp Arg Thr Ile Glu Leu Glu Ala Arg Glu Tyr
 245 250 255

Asp Glu Arg Leu Ala His Gly Glu Glu Phe Met Thr Ser Ser Cys Cys
 260 265 270

Pro Ala Tyr Val Ser Ala Val Ile Lys Glu Lys Pro Asp Leu Phe His
 275 280 285

His Ile Ser Ser Thr Leu Ser Pro Met Ala Gln Val Ala His Ile Leu
 290 295 300

Lys Glu Lys Asp Pro Glu Ala Lys Ile Ala Phe Ile Gly Pro Cys Val
 305 310 315 320

Ala Lys Lys Glu Glu Gly Lys Arg Pro Glu Thr Lys Val Asp Phe Val
 325 330 335

Leu Thr Phe Glu Glu Leu Met Val Trp Leu Asp Tyr Ala Gly Ile Asn
 340 345 350

Pro Ala Glu Glu Ser Glu Gln
 355

<210> 75
 <211> 790
 <212> PRT
 <213> Geobacter metallireducens

<400> 75

Met Cys His Trp Leu His Arg Glu Ala Gly Leu Val Tyr Asp Pro Ala
 1 5 10 15

Val Asp Gln Ala Ile Asn Arg Val Ser Gly Leu Thr Leu Ser Ala Gly
 20 25 30

Arg Thr Met Glu Pro Ile Ile Thr Val Lys Glu Lys Cys Arg Lys Cys

35

40

45

Tyr Cys Cys Val Arg Ser Cys Pro Val Lys Ala Ile Lys Val Ala Lys
 50 55 60
 Ser Tyr Thr Glu Ile Ile Val Asp Arg Cys Ile Gly Cys Gly Asn Cys
 65 70 75 80
 Leu Ser Asn Cys Pro Gln Gln Ala Lys Met Val Ala Asp Lys Val Gly
 85 90 95
 Val Thr Glu Lys Leu Leu Ser Ser Gly Glu Glu Val Ile Ala Val Leu
 100 105 110
 Gly Ser Ser Phe Pro Ala Phe Phe His Asn Val Thr Pro Gly Gln Leu
 115 120 125
 Val Ala Gly Leu Arg Lys Ile Gly Phe Ala Glu Val His Glu Gly Ser
 130 135 140
 Tyr Gly Ala Glu Leu Ile Ala Asp Asp Tyr Ala Arg Ile Thr Ser Glu
 145 150 155 160
 Lys Gly His Pro Arg Ile Ser Ser His Cys Pro Ala Ile Val Asp Leu
 165 170 175
 Ile Glu Arg His Tyr Pro Lys Leu Val Gly Asn Leu Val Pro Val Val
 180 185 190
 Ser Pro Met Val Ala Met Gly Arg Tyr Leu Lys Gly Thr Leu Gly Gln
 195 200 205
 His Val Arg Val Val Tyr Ile Ser Ser Cys Val Ala Asn Lys Leu Glu
 210 215 220
 Thr Gln Thr Gln Glu Thr Arg Gly Ala Val Asp Ile Val Leu Thr Tyr
 225 230 235 240
 Arg Glu Leu Glu Gly Ile Phe Arg Ser Arg Gln Ile Ala Leu Pro Ala
 245 250 255
 Leu Ala Asp Glu Pro Leu Asp Gly Ile Arg Pro Gly Ala Gly Arg Leu
 260 265 270
 Phe Pro Ile Ala Asp Gly Thr Phe Arg Ala Phe Gly Ile Pro Phe Asp
 275 280 285
 Pro Leu Asp Thr Glu Ile Val Ala Ala Cys Gly Glu Val Asn Val Met
 290 295 300
 Gly Ile Ile Asn Asp Leu Ala Ala Gly Arg Ile Ser Pro Arg Ile Ala
 305 310 315 320

060513 second sequence listing formatted.txt

Asp Leu Arg Phe Cys Tyr Asp Gly Cys Ile Gly Gly Pro Gly Arg Asn
325 330 335

Arg Ala Leu Thr Glu Phe Tyr Arg Arg Asn Arg Val Ile Ala His Phe
340 345 350

Lys Gln Glu Val Pro Cys Arg Thr Val Pro Asn Ser Leu Leu Glu Ala
355 360 365

Gly Arg Val Ser Phe Gly Arg Ser Phe Ala Ser Lys Tyr Ala Lys Leu
370 375 380

Glu Ala Pro Lys Ala Asn Asp Val Arg Lys Ile Leu Asn Ala Thr Asn
385 390 395 400

Lys Phe Thr Val Lys Asp Glu Leu Asn Cys Arg Ala Cys Gly Tyr Arg
405 410 415

Thr Cys Arg Glu Tyr Ala Val Ala Val Phe Gln Gly Leu Ala Glu Ile
420 425 430

Glu Met Cys Leu Pro Tyr Asn Leu Gln Gln Leu Glu Glu Asp Arg Gly
435 440 445

Arg Leu Ile Gln Lys Tyr Glu Leu Ala Arg Arg Glu Leu Glu Arg Glu
450 455 460

Tyr Gly Asp Glu Phe Ile Val Gly Asn Asp Arg Lys Thr Leu Asp Val
465 470 475 480

Leu Gly Leu Ile Lys Gln Val Gly Pro Thr Pro Thr Thr Val Leu Ile
485 490 495

Arg Gly Glu Ser Gly Thr Gly Lys Glu Leu Thr Ala Arg Ala Ile His
500 505 510

Arg Tyr Ser Lys Arg Asn Asp Lys Pro Leu Val Thr Val Asn Cys Thr
515 520 525

Thr Ile Thr Asp Ser Leu Leu Glu Ser Glu Leu Phe Gly His Lys Arg
530 535 540

Gly Ala Phe Thr Gly Ala Val Ala Asp Lys Lys Gly Leu Phe Glu Ala
545 550 555 560

Ala Asp Gly Gly Thr Ile Phe Leu Asp Glu Ile Gly Asp Ile Thr Pro
565 570 575

Lys Leu Gln Ala Glu Leu Leu Arg Val Leu Asp Met Gly Glu Val Arg
580 585 590

Pro Val Gly Gly Thr Ala Ala Lys Lys Val Asp Val Arg Leu Ile Ala

595

600

605

Ala Thr Asn Lys Asn Leu Glu Gln Gly Val Arg Glu Gly Trp Phe Arg
610 615 620

Glu Asp Leu Tyr Tyr Arg Leu Asn Val Phe Thr Ile Thr Met Pro Pro
625 630 635 640

Leu Arg Ser Arg Val Glu Ser Ile Pro Ile Leu Val His His Phe Met
645 650 655

Asp Lys Ala Ser Thr Lys Leu Asn Lys Arg Met Val Gly Ile Glu Asp
660 665 670

Arg Ala Val Lys Ala Leu Thr Lys Tyr Pro Trp Pro Gly Asn Ile Arg
675 680 685

Glu Met Gln Asn Val Ile Glu Arg Ala Ala Val Leu Thr His Asp Gly
690 695 700

Val Ile Arg Val Glu Asn Phe Pro Leu Ala Leu Ser Glu Gly Leu Glu
705 710 715 720

Glu Gly Phe Ala Thr Gly Leu Asp Ile His Ala Ala Ser Phe Arg Ser
725 730 735

Glu Arg Glu Gln His Met Gly Lys Leu Glu Lys Lys Leu Ile Gln Arg
740 745 750

Tyr Leu Thr Glu Ala Asn Gly Asn Ile Ser Arg Ala Ala Lys Leu Ala
755 760 765

Asn Ile Pro Arg Arg Thr Phe Tyr Arg Leu Leu Asp Lys Tyr Arg Leu
770 775 780

Arg Glu Arg Asp Val Arg
785 790

<210> 76

<211> 450

<212> PRT

<213> Clostridium acetobutylicum

<400> 76

Met Asn Asn Lys Tyr Ile Glu Leu Phe Lys Ser Leu Val Asp Ser Tyr
1 5 10 15

Tyr Asn Asp Thr Phe Asp Ser Phe Val Tyr His Ile Leu Ser Asp Glu
20 25 30

Glu Val Asp Lys Lys Glu Leu Ser Lys Val Ile Ser Ser Leu Cys Gly
35 40 45

Val Ser Val Glu Phe Lys Asp Thr Glu Thr Tyr Ile Ser Glu Leu Lys
 50 55 60
 Lys Ala Ile Ser Asn Tyr Lys Cys Thr Asp Asn Ile Val Glu Lys Ile
 65 70 75 80
 Lys Glu Cys Asp Ser Ser Cys His Ser Asn Glu Gly Glu Thr Pro Cys
 85 90 95
 Gln Lys Ser Cys Pro Phe Asp Ala Ile Leu Val Asp Lys Asn Thr Lys
 100 105 110
 Thr Ser His Ile Gln Lys Asp Leu Cys Thr Asp Cys Gly Asn Cys Ile
 115 120 125
 Thr Ser Cys Pro Ser Gly Ser Ile Leu Asp Lys Ile Glu Phe Met Pro
 130 135 140
 Leu Leu Asn Leu Phe Lys Asn Asn Glu Thr Val Ile Ala Ala Val Ala
 145 150 155 160
 Pro Ala Ile Ala Gly Gln Phe Gly Glu Asn Val Ser Leu Glu Met Leu
 165 170 175
 Arg Thr Ala Phe Lys Lys Val Gly Phe Ala Asp Met Val Glu Val Ala
 180 185 190
 Phe Phe Ala Asp Met Leu Thr Ile Lys Glu Ala Phe Glu Phe Asn Glu
 195 200 205
 Leu Val Asn Ser Lys Asp Asp Leu Met Ile Thr Ser Cys Cys Cys Pro
 210 215 220
 Met Trp Val Ser Met Ile Arg Lys Ile Tyr Lys Asp Leu Ala Arg His
 225 230 235 240
 Val Ser Pro Ser Val Ser Pro Met Ile Ala Ser Gly Arg Val Ile Lys
 245 250 255
 Lys Leu Asn Pro Asn Cys Lys Val Val Phe Ile Gly Pro Cys Ile Ala
 260 265 270
 Lys Lys Ala Glu Ser Arg Ser Gln Asp Ile Ser Asp Ala Ile Asp Phe
 275 280 285
 Val Leu Thr Phe Glu Glu Leu Lys Gly Ile Phe Asp Val Leu Asp Ile
 290 295 300
 Asp Pro Glu Lys Leu Pro Glu Thr His Thr Lys Ser Tyr Ala Ser Arg
 305 310 315 320
 Glu Gly Arg Leu Tyr Gly Arg Thr Gly Gly Val Ser Thr Ser Val Asp
 325 330 335

Glu Ala Val Lys Arg Ile Phe Pro Asn Lys His His Leu Phe Lys Ser
 340 345 350

Thr Lys Val Asp Gly Val Lys Asp Cys Lys Asp Ile Leu Asn Lys Thr
 355 360 365

Gln Ala Gly Asn Ile Gly Ala Asn Phe Leu Glu Gly Met Gly Cys Val
 370 375 380

Gly Gly Cys Val Gly Gly Pro Lys Ala Ile Val His Lys Asp Gln Gly
 385 390 395 400

Arg Glu Ser Val Asn Lys Thr Ala Glu Ser Ser Glu Ile Lys Ile Ser
 405 410 415

Val Asp Ser Glu Arg Met Lys Asp Ile Leu Ser Arg Ile Gly Ile Asn
 420 425 430

Ser Ile Glu Asp Phe Gly Asp Lys Ser Lys Val Asp Ile Phe Glu Arg
 435 440 445

Arg Phe
 450

<210> 77
 <211> 106
 <212> PRT
 <213> Shewanella oneidensis

<400> 77

Met Asn Lys Lys Lys His Leu Phe Ala Glu Asp Ser Phe Phe Leu Ser
 1 5 10 15

Arg Arg Lys Phe Met Ala Val Gly Ala Ala Phe Val Ala Ala Leu Ala
 20 25 30

Ile Pro Ile Gly Trp Phe Thr Ser Lys Leu Glu Arg Arg Asn Glu Tyr
 35 40 45

Ile Lys Ala Arg Ser Gln Gly Leu Tyr Lys Asp Asp Ser Leu Ala Lys
 50 55 60

Thr Arg Val Ser His Ala Asn Pro Ala Val Glu Lys Tyr Tyr Lys Glu
 65 70 75 80

Phe Gly Gly Glu Pro Leu Gly His Met Ser His Glu Leu Leu His Thr
 85 90 95

His Phe Val Asp Arg Thr Lys Leu Ser Ser
 100 105

<210> 78

<211> 504
 <212> PRT
 <213> Entamoeba histolytica

<400> 78

Met Ser Thr Gln Leu Thr Pro Leu Arg Asn Lys Ile Ile Ser Glu Val
 1 5 10 15

Val Lys Cys Phe Lys Ser Gly Arg Phe Ile Glu Asp Ile Asp Lys Leu
 20 25 30

Pro Thr Ile Leu Thr Asp Gly Asp Gly Trp Lys Pro Thr Ser Lys Phe
 35 40 45

Val His Ser Arg Glu Gln Glu Gly Ile Tyr Arg Glu Lys Val Leu
 50 55 60

Ser Val Leu Gly Phe Val Asp Gly Glu Tyr Asp Asp Ile Thr Pro Leu
 65 70 75 80

His Val Tyr Ala Gln Lys Ala Leu Glu Arg Thr Ser Leu His Glu Pro
 85 90 95

Val Phe Gly Ile Ser Gln Lys Gly Cys Asn Lys Cys His Phe Asn Gly
 100 105 110

Tyr Phe Val Thr Gln Ala Cys Glu Gly Cys Thr Ser Arg Pro Cys Ser
 115 120 125

Val Asn Cys Pro Lys Lys Cys Ile Ser Phe Gly Glu Asp Gly Arg Ala
 130 135 140

Val Ile Asn Gln Asn Asn Cys Ile Lys Cys Gly Arg Cys Tyr Lys Phe
 145 150 155 160

Cys Pro Tyr Gly Ala Ile Ile Ser Lys Ser Val Pro Cys Val Lys Ala
 165 170 175

Cys Pro Cys Gly Ala Met Leu Asp Ser Pro Glu Gly Val Lys Thr Ile
 180 185 190

Asp Phe Glu Lys Cys Ile Asn Cys Gly Gly Cys Met Arg Ala Cys Pro
 195 200 205

Phe Gly Ala Ile Leu Pro Arg Ser Asn Leu Ile Asp Val Leu Lys Ile
 210 215 220

Leu Pro Thr Lys Lys Val Val Ala Cys Pro Ala Pro Ser Ile Ala Ala
 225 230 235 240

His Phe Gly Lys Tyr Asp Leu Ala Leu Val Ser Gly Gly Leu Ile Gln
 245 250 255

Val Gly Phe Thr Ser Val Glu Asp Val Ser Tyr Gly Ala Asp Leu Cys
 260 265 270
 Ala Leu Asn Glu Ala Lys Glu Phe Glu Glu Arg Ile Val Lys Asn Lys
 275 280 285
 Lys Asp Phe Met Thr Thr Ser Cys Cys Pro Ala Tyr Ile Asn Ala Ile
 290 295 300
 Asn Lys His Met Pro Glu Leu Lys Glu Asn Val Ser His Thr Pro Thr
 305 310 315 320
 Pro Met His Phe Ala Thr Gln Ala Val Lys Asp Arg Asp Gln Glu Thr
 325 330 335
 Val Thr Val Phe Ile Gly Pro Cys Asn Ala Lys Arg Trp Glu Thr Leu
 340 345 350
 Gln Asp Ser Thr Thr Asp Tyr Cys Leu Thr Phe Asp Glu Ile Phe Gly
 355 360 365
 Leu Phe Glu Gly Ser Gly Ile Asp Leu Ser Lys Val Gln Pro Tyr Thr
 370 375 380
 Phe Val Asp Lys Ala His Lys Glu Gly Lys Ile Phe Ala Val Ser Gly
 385 390 395 400
 Gly Val Ala Ser Ala Val Ala Ser Leu Leu Pro Lys Glu Val Pro Asp
 405 410 415
 Gly Val Ile Lys Pro Thr Ile Ile Asp Gly Phe Ser Gln Glu Asn Phe
 420 425 430
 Lys Arg Leu Lys Asn Phe Lys Lys Asn Ile Thr Gly Asn Leu Val Glu
 435 440 445
 Val Met Val Cys Glu Gly Gly Cys Ala Tyr Gly Pro Gly Cys Pro Gly
 450 455 460
 Leu Asn Thr Pro Ala Thr Ser Ala Lys Ile Lys Ile Ala Val Asp Lys
 465 470 475 480
 Met Glu Ala His Pro Glu Gly Arg Trp Val Gly Leu Pro Asn Ser Gln
 485 490 495
 Ile Lys Pro Ile Lys Val Glu Asn
 500

<210> 79
 <211> 560
 <212> PRT
 <213> Cryptosporidium parvum

<400> 79

060513 second sequence listing formatted.txt

Met Phe Ser Thr Ala Val Lys Leu Ala Asn Leu Asp Asp Tyr Leu Glu
1 5 10 15

Ser Ser Gln Asp Cys Ile Val Ser Leu Leu Ser Asp Lys Asp Asp Thr
20 25 30

Lys Pro Lys Ile Ala Val Met Arg Pro Ala Lys Ala Gln Gly Asn Lys
35 40 45

Asp Asp Lys Lys Ser Gly Thr Ser Asp Lys Ala Thr Val Asn Val Ala
50 55 60

Asp Cys Leu Ala Cys Ser Gly Cys Val Thr Ser Ala Glu Ala Lys Leu
65 70 75 80

Leu Glu Asp Gln Asn Val Ser Glu Phe Met Asn Ile Leu Lys Gln Lys
85 90 95

Arg Leu Thr Val Val Ser Ile Ser Asn Gln Ser Cys Ser Ser Phe Ala
100 105 110

Cys His Leu Asn Cys Asp Leu Ile Thr Ile Gln Arg Lys Leu Ser Gly
115 120 125

Leu Phe Lys His Ile Gly Ala Arg Phe Val Met Asn Ser Thr Ile Ser
130 135 140

Glu Tyr Ile Ser Leu Leu Glu Thr Lys Tyr Glu Phe Ile Ser Arg Tyr
145 150 155 160

Lys Ala Lys Ser Asp Leu Pro Met Ile Ile Ser His Cys Pro Gly Trp
165 170 175

Ile Cys Tyr Ser Glu Lys Ser Leu Asn Ser Ser Val Leu Pro Leu Leu
180 185 190

Ser Lys Val Arg Ser Ala Gln Gln Leu Gln Gly Ile Leu Ile Lys Thr
195 200 205

Leu Thr Leu Glu Ile Tyr Asn Gln Leu Leu Phe Leu Tyr Lys Phe Arg
210 215 220

Leu Ser Asn Ser Tyr Arg Thr Asn Met Asn Val Lys Ser Thr Phe Thr
225 230 235 240

Gln Asn Asp Asn Phe Val Glu Gln Ser Asp Ile Phe His Val Ala Ile
245 250 255

Met Pro Cys His Asp Lys Lys Leu Glu Ser Thr Arg Ser Ser Leu Ser
260 265 270

Leu Lys Ser Ser Asp Lys Asn Ser Ser Cys Pro Glu Val Asp Ile Val

275

280

285

Leu Ala Thr Ser Glu Val Gly Glu Ile Ile Lys Leu Ala Gly Phe Asn
 290 295 300

Ser Leu Leu Asp Val Pro Glu Ala Pro Leu Asp Asn Leu Trp Leu Asn
 305 310 315 320

Gln Asn Phe Gln Ile Thr Lys Lys His Asn Leu Ser Leu Leu Ile Thr
 325 330 335

Glu Asn Tyr Val Ser Asn Gln Ile Leu Asn Gln Phe Ser Trp Leu Ile
 340 345 350

Pro Ser Tyr Phe Asn Ser Asn Ser Gly Gly Phe Cys Glu Tyr Ile Ile
 355 360 365

Arg Ser Ala Ile Lys Glu Leu Ala Gly Asp His Ile Asp Asn Lys Val
 370 375 380

Gln Leu Pro Phe Asn Lys Leu Lys Asn Asp Ile Leu Glu Ala Lys Tyr
 385 390 395 400

Ile Lys Asn Asn Val Glu Leu Asn Tyr Cys Leu Ala Tyr Gly Phe Arg
 405 410 415

Ala Ile Gln Ser Ile Ser Arg Lys Leu Asn Leu Gln Lys Asn Ala Ser
 420 425 430

Gln Asn Thr Gln Tyr Lys Gln Ser Val Val Asn His Val Asn Tyr His
 435 440 445

Leu Ile Glu Ala Met Ala Cys Pro Thr Gly Cys Val Ser Gly Gly Gly
 450 455 460

Gln Ile Leu Ser Gln Asn Asp Gln Asn Asp Asp Asn Ser Asp Leu Asn
 465 470 475 480

Lys Leu Arg Lys Asn Ile Lys Phe Ile Asp Glu Val Gln Glu Ala Leu
 485 490 495

Tyr Lys Gly Ile Asn Leu Asn Lys Asn Gln Glu Val Ile Leu Pro Asp
 500 505 510

Glu Ile Pro Ile Val Asn Ile Leu Tyr Glu Tyr Leu Ile His Ile Asp
 515 520 525

Lys Gln Ile Asp Arg Ser Ser Gly Leu Lys Leu Pro Phe Leu Arg Asn
 530 535 540

Asp Phe Val Ser Ile Asn Glu Val Pro Thr Ala Ser Ser Leu Lys Trp
 545 550 555 560

<210> 80
 <211> 469
 <212> PRT
 <213> Kluyveromyces lactis

<400> 80

Met Ser Ala Leu Leu Arg Asp Ala Asp Leu Asn Asp Phe Ile Ser Pro
 1 5 10 15

Gly Leu Ala Cys Val Lys Pro Ala Gln Pro Gln Lys Val Glu Lys Lys
 20 25 30

Pro Ser Phe Glu Val Glu Val Gly Ile Glu Ser Ser Glu Pro Glu Lys
 35 40 45

Val Ser Ile Ser Leu Gln Asp Cys Leu Ala Cys Ala Gly Cys Ile Thr
 50 55 60

Ser Ser Glu Glu Ile Leu Leu Ser Lys Gln Ser His Lys Val Phe Leu
 65 70 75 80

Glu Lys Trp Ser Glu Leu Glu Glu Leu Asp Glu Arg Ser Leu Ala Val
 85 90 95

Ser Ile Ser Pro Gln Cys Arg Leu Ser Leu Ala Asp Tyr Tyr Ser Met
 100 105 110

Cys Leu Ala Asp Leu Asp Arg Cys Phe Gln Asn Phe Met Lys Thr Lys
 115 120 125

Phe Asn Ala Lys Tyr Val Val Gly Thr Gln Phe Gly Arg Ser Ile Ser
 130 135 140

Ile Ser Arg Ile Asn Ala Thr Leu Lys Asp Arg Val Pro Glu Asn Glu
 145 150 155 160

Gly Pro Leu Leu Cys Ser Val Cys Pro Gly Phe Val Leu Tyr Ala Glu
 165 170 175

Lys Thr Lys Pro Glu Leu Ile Pro His Met Leu Asp Val Lys Ser Pro
 180 185 190

Gln Gln Ile Thr Gly Asn Leu Leu Lys Gln Ala Asp Pro Thr Cys Tyr
 195 200 205

His Leu Ser Ile Met Pro Cys Phe Asp Lys Lys Leu Glu Ala Ser Arg
 210 215 220

Glu Glu Cys Glu Lys Glu Val Asp Cys Val Ile Thr Pro Lys Gln Phe
 225 230 235 240

Val Ala Met Leu Gly Asp Leu Ser Ile Asp Phe Lys Ser Tyr Met Thr
 245 250 255

060513 second sequence listing formatted.txt

Glu Tyr Asp Ser Ser Lys Glu Leu Cys Pro Ser Gly Trp Asp Tyr Lys
260 265 270

Leu His Trp Leu Ser Asn Glu Gly Ser Ser Ser Gly Gly Tyr Ala Tyr
275 280 285

Gln Tyr Leu Leu Ser Leu Gln Ser Ser Asn Pro Glu Ser Asp Ile Ile
290 295 300

Thr Ile Glu Gly Lys Asn Ser Asp Val Thr Glu Tyr Arg Leu Val Ser
305 310 315 320

Lys Ser Lys Gly Val Ile Ala Ser Ser Ser Glu Val Tyr Gly Phe Arg
325 330 335

Asn Ile Gln Asn Leu Val Arg Lys Leu Ser Gln Ser Ala Ser Val Lys
340 345 350

Lys Arg Gly Ile Lys Val Lys Arg Arg Gly Gln Ser Val Leu Lys Ser
355 360 365

Gly Glu Thr Ser Glu Lys Thr Thr Lys Val Leu Thr Ala Asp Pro Ala
370 375 380

Lys Thr Asp Phe Val Glu Val Met Ala Cys Pro Ser Gly Cys Ile Asn
385 390 395 400

Gly Gly Gly Leu Leu Asn Glu Glu Lys Asn Ala Asn Arg Arg Lys Gln
405 410 415

Leu Ala Gln Asp Leu Ser Leu Ala Tyr Thr Lys Val His Ser Val Asn
420 425 430

Ile Pro Asp Ile Val His Ala Tyr Asp Asp Lys Ser Asn Asp Phe Lys
435 440 445

Tyr Asn Leu Arg Val Ile Glu Pro Ser Thr Ser Ser Asp Val Val Ala
450 455 460

Val Gly Asn Thr Trp
465

<210> 81
<211> 365
<212> PRT
<213> Encephalitozoon cuniculi

<400> 81

Met Asp Ala Leu Ile Arg Pro Pro Met Ser Phe Phe Ala Asp Leu Pro
1 5 10 15

Lys Asp Asn Lys Lys Cys Ile Lys Ile Gly Ser Pro Leu Ala Leu Ser
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20

25

30

Leu Ser Asp Cys Leu Ala Cys Ser Gly Cys Val Ser Ala Asp Glu Ala
35 40 45

Gly Ala Leu Ser Glu Asp Leu Ser Phe Val Leu Asp Leu Ser Pro Gln
50 55 60

Thr Ser Phe Val Leu Ser Pro Gln Ser Lys Ile Asn Ile Phe Asn Leu
65 70 75 80

Tyr Arg Glu Asp Gly Met Glu Tyr Arg Glu Phe Glu Ala Val Leu Ser
85 90 95

Ser Phe Leu Arg Ser Lys Phe Asn Ile His Arg Ile Val Asp Thr Ser
100 105 110

Tyr Leu Arg Ser Lys Ile Tyr Glu Glu Thr Tyr Arg Glu Tyr Met Ala
115 120 125

Thr Asn His Leu Ile Val Ser Ala Cys Pro Gly Val Val Thr Tyr Ile
130 135 140

Glu Arg Thr Ala Pro Tyr Leu Ile Gly Tyr Leu Ser Arg Val Lys Ser
145 150 155 160

Pro Gln Gln Met Ala Phe Ser Leu Val Lys Gly Ser Arg Thr Val Ser
165 170 175

Val Met Pro Cys Gln Asp Lys Lys Leu Glu Asn Gly Arg Asp Gly Val
180 185 190

Lys Phe Asp Phe Ile Leu Thr Thr Arg Gly Phe Cys Lys Ala Leu Asp
195 200 205

Ser Leu Gly Phe Arg Arg Pro Ala Arg Ala Ser Gly Lys Ser Leu Cys
210 215 220

Ser Met Glu Glu Ala Glu Thr Thr Gln Trp Asn Ile Gly Thr Ser Ser
225 230 235 240

Gly Gly Tyr Ala Glu Phe Ile Leu Gly Lys His Cys Val Val Glu Thr
245 250 255

Arg Glu Ile Arg Asn Gly Ile Lys Glu His Leu Leu Asp Asp Gly Arg
260 265 270

Thr Ile Ser Gln Ile Thr Gly Leu Glu Asn Ser Ile Asn Tyr Phe Lys
275 280 285

Ser Ser Lys Thr Lys Gly Pro Arg His Lys Met Thr Glu Ile Phe Leu
290 295 300

060513 second sequence listing formatted.txt

Cys Lys Asn Gly Cys Ile Gly Gly Pro Gly Gln Glu Arg Val Asn Asp
305 310 315 320

Val Glu Met Asp Ile Arg Glu Tyr Asp Arg Asn Gly Arg Glu Gln Pro
325 330 335

Arg Ile Phe Tyr Ser Ser Pro Gly Leu Glu Glu Lys Arg Val Phe Arg
340 345 350

Glu Val Lys Ala Lys Arg Val Asp Leu Arg Val Asp Trp
355 360 365

<210> 82
<211> 127
<212> PRT
<213> Tritrichomonas foetus

<220>
<221> misc_feature
<222> (85)..(85)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (124)..(124)
<223> Xaa can be any naturally occurring amino acid

<400> 82

Met Cys Ile Lys Ala Cys Asn Ser Val Ala Gly Gln Gly Val Leu Lys
1 5 10 15

Leu Val Lys Val Gly Asn Lys Lys Leu Val Ser Thr Lys Ser Gly Lys
20 25 30

Pro Leu Gln Glu Thr Asn Cys Ile Lys Cys Gly Gln Cys Thr Leu Val
35 40 45

Cys Gly Pro Gly Ala Leu Thr Gln Lys Asp Ala Ile Gln Thr Val Ser
50 55 60

Glu Val Leu Lys Asn Pro Gly Asp Lys Val Leu Val Cys Gln Thr Ala
65 70 75 80

Pro Ala Ile Arg Xaa Asn Leu Ala Asp Gly Leu Gly Met Pro Ala Gly
85 90 95

Ser Ile Ile Thr Gly Lys Met Val Thr Ala Leu Lys Met Leu Gly Phe
100 105 110

Lys Tyr Val Phe Asp Thr Asn Phe Gly Thr Asp Xaa Thr Ile Gly
115 120 125

<210> 83
<211> 449
<212> PRT

<213> Scenedesmus obliquus

<400> 83

Met Pro Glu Trp Gln Pro Gly Gly Arg Tyr Ala Val Ser Val Arg Pro
 1 5 10 15

Pro Val Asn Arg Arg Ala Val Val Ala Ala Glu Arg Arg Arg Leu Val
 20 25 30

Val Arg Ala Ala Gly Pro Thr Ala Glu Cys Asp Cys Pro Pro Ala Pro
 35 40 45

Ala Pro Lys Ala Pro His Trp Gln Gln Thr Leu Asp Glu Leu Ala Lys
 50 55 60

Pro Lys Glu Gln Arg Lys Val Met Ile Ala Gln Ile Ala Pro Ala Val
 65 70 75 80

Arg Val Ala Ile Ala Glu Thr Met Gly Leu Asn Pro Gly Asp Val Thr
 85 90 95

Val Gly Gln Met Val Thr Gly Leu Arg Met Leu Gly Phe Asp Tyr Val
 100 105 110

Phe Asp Thr Leu Phe Gly Ala Asp Leu Thr Ile Met Glu Glu Gly Thr
 115 120 125

Glu Leu Arg His Arg Leu Gln Asp His Leu Glu Gln His Pro Asn Lys
 130 135 140

Glu Glu Pro Leu Pro Met Phe Thr Ser Cys Cys Pro Gly Trp Val Ala
 145 150 155 160

Met Val Glu Lys Ser Asn Pro Glu Leu Ile Pro Tyr Leu Ser Ser Cys
 165 170 175

Lys Ser Pro Gln Met Met Leu Gly Ala Val Ile Lys Asn Tyr Phe Ala
 180 185 190

Ala Glu Ala Gly Ala Lys Pro Glu Asp Ile Cys Asn Val Ser Val Met
 195 200 205

Pro Cys Val Arg Lys Gln Gly Glu Ala Asp Arg Glu Trp Phe Asn Thr
 210 215 220

Thr Gly Ala Gly Gly Ala Asn Val Asp His Val Met Thr Thr Ala Glu
 225 230 235 240

Leu Gly Lys Ile Phe Val Glu Arg Gly Ile Lys Leu Asn Asp Leu Gln
 245 250 255

Glu Ser Pro Phe Asp Asn Pro Val Gly Glu Gly Ser Gly Gly Gly Val
 260 265 270

060513 second sequence listing formatted.txt

Leu Phe Gly Thr Thr Gly Gly Val Met Glu Ala Ala Leu Arg Thr Val
275 280 285

Tyr Glu Val Val Thr Gln Lys Pro Leu Asp Arg Ile Val Phe Glu Asp
290 295 300

Val Arg Gly Leu Glu Gly Ile Lys Glu Ser Thr Leu His Leu Thr Pro
305 310 315 320

Gly Pro Thr Ser Pro Phe Lys Ala Phe Ala Gly Ala Asp Gly Thr Gly
325 330 335

Ile Thr Leu Asn Ile Ala Val Ala Asn Gly Leu Gly Asn Ala Lys Lys
340 345 350

Leu Ile Lys Gln Leu Ala Ala Gly Glu Ser Lys Tyr Asp Phe Ile Glu
355 360 365

Val Met Ala Cys Pro Gly Gly Cys Ile Gly Gly Gly Gly Gln Pro Arg
370 375 380

Ser Ala Asp Lys Gln Ile Leu Gln Lys Arg Gln Ala Ala Met Tyr Asp
385 390 395 400

Leu Asp Glu Arg Ala Val Ile Arg Arg Ser His Glu Asn Pro Leu Ile
405 410 415

Gly Ala Leu Tyr Glu Lys Phe Leu Gly Glu Pro Asn Gly His Lys Ala
420 425 430

His Glu Leu Leu His Thr His Tyr Val Ala Gly Gly Val Pro Asp Glu
435 440 445

Lys

<210> 84
<211> 477
<212> PRT
<213> Anopheles gambiae

<400> 84

Ser Arg Phe Ser Ser Ala Leu Gln Leu Thr Asp Leu Asp Asp Phe Ile
1 5 10 15

Thr Pro Ser Gln Glu Cys Ile Lys Pro Val Lys Ile Glu Thr Ser Lys
20 25 30

Ser Lys Thr Gly Ala Lys Ile Thr Ile Gln Glu Asp Gly Ser Tyr Val
35 40 45

Gln Glu Ser Ser Ser Gly Ile Gln Lys Leu Glu Lys Val Glu Ile Thr

50

55

60

Leu Ala Asp Cys Leu Ala Cys Ser Gly Cys Ile Thr Ser Ala Glu Gly
65 70 75 80

Val Leu Ile Ser Gln Gln Ser Gln Glu Glu Leu Leu Arg Val Met Asn
85 90 95

Ala Asn Asn Leu Ala Lys Leu Asn Asn Gln Arg Asp Glu Ile Lys Phe
100 105 110

Val Val Phe Thr Val Ser Gln Gln Pro Ile Leu Ser Leu Ala Arg Lys
115 120 125

Tyr Asn Leu Thr Pro Glu Asp Thr Phe Glu His Ile Ala Gly Tyr Phe
130 135 140

Lys Lys Leu Gly Ala Asp Met Val Val Asp Thr Lys Ile Ala Asp Asp
145 150 155 160

Leu Ala Leu Ile Glu Cys Arg Asn Glu Phe Ile Glu Arg Tyr Asn Thr
165 170 175

Asn Arg Lys Leu Leu Pro Met Leu Ala Ser Ser Cys Pro Gly Trp Val
180 185 190

Cys Tyr Ala Glu Lys Thr His Gly Asn Phe Ile Leu Pro Tyr Ile Ala
195 200 205

Thr Thr Arg Ser Pro Gln Gln Ile Met Gly Val Leu Val Lys Gln Tyr
210 215 220

Leu Ala Lys Gln Leu Gln Thr Thr Gly Asp Arg Ile Tyr His Val Thr
225 230 235 240

Val Met Pro Cys Tyr Asp Lys Lys Leu Glu Ala Ser Arg Glu Asp Phe
245 250 255

Phe Ser Glu Val Glu Asn Ser Arg Asp Val Asp Cys Val Ile Thr Ser
260 265 270

Ile Glu Ile Glu Gln Met Leu Asn Ser Leu Asp Leu Pro Ser Leu Gln
275 280 285

Leu Val Glu Arg Cys Ala Ile Asp Trp Pro Trp Pro Thr Val Arg Pro
290 295 300

Ser Ala Phe Val Trp Gly His Glu Ser Ser Gly Ser Gly Gly Tyr Ala
305 310 315 320

Glu Tyr Ile Phe Lys Tyr Ala Ala Arg Lys Leu Phe Asn Val Gln Leu
325 330 335

060513 second sequence listing formatted.txt

Asp Thr Val Ala Phe Lys Pro Leu Arg Asn Asn Asp Met Arg Glu Ala
340 345 350

Val Leu Glu Gln Asn Gly Gln Val Leu Met Arg Phe Ala Ile Ala Asn
355 360 365

Gly Phe Arg Asn Ile Gln Asn Met Val Gln Lys Leu Lys Arg Gly Lys
370 375 380

Ser Thr Tyr Asp Tyr Val Glu Ile Met Ala Cys Pro Ser Gly Cys Leu
385 390 395 400

Asn Gly Gly Ala Gln Ile Arg Pro Glu Glu Gly Arg Ala Ala Arg Glu
405 410 415

Leu Thr Ala Glu Leu Glu Cys Met Tyr Arg Ser Leu Pro Gln Ser Thr
420 425 430

Pro Glu Asn Asp Cys Val Gln Thr Met Tyr Ala Thr Phe Phe Asp Ser
435 440 445

Glu Gly Asp Leu Asn Lys Arg Gln Ser Leu Leu His Thr Ser Tyr His
450 455 460

Gln Ile Glu Lys Ile Asn Ser Ala Leu Asn Ile Lys Trp
465 470 475

<210> 85
<211> 410
<212> PRT
<213> Shewanella oneidensis

<400> 85

Met Thr Thr Thr Thr Tyr Gln Pro Gly Glu Ile Gln Gly Leu Ile Lys
1 5 10 15

Ile Asn Ala Ser Lys Cys Lys Gly Cys Asp Ala Cys Lys Gln Phe Cys
20 25 30

Pro Thr His Ala Ile Asn Gly Ala Ser Gly Ala Val His Ser Ile Asp
35 40 45

Glu Asp Lys Cys Leu Ser Cys Gly Gln Cys Leu Ile Asn Cys Pro Phe
50 55 60

Ser Ala Ile Glu Glu Thr His Ser Ala Leu Glu Thr Val Ile Lys Lys
65 70 75 80

Leu Ala Asp Lys Asn Thr Thr Val Val Gly Ile Ile Ala Pro Ala Val
85 90 95

Arg Val Ala Ile Gly Glu Glu Phe Gly Leu Gly Thr Gly Glu Leu Val
100 105 110

Thr Gly Lys₁₁₅ Leu Tyr Gly Ala Met₁₂₀ Asn Gln Ala Gly Phe₁₂₅ Lys Ile Phe
 Asp Cys₁₃₀ Asn Phe Ala Ala Asp₁₃₅ Leu Thr Ile Met Glu₁₄₀ Glu Gly Ser Glu
 Phe Ile His Arg Leu His₁₅₀ Ala Asn Val Lys Gly₁₅₅ Glu Ala Asn Ala Gly₁₆₀
 Pro Leu Pro Gln Phe₁₆₅ Thr Ser Cys Cys Pro₁₇₀ Gly Trp Val Arg Tyr₁₇₅ Leu
 Glu Thr Arg Tyr₁₈₀ Pro Ala Leu Leu Pro₁₈₅ Asn Leu Ser Thr Ala₁₉₀ Lys Ser
 Pro Gln Gln₁₉₅ Met Ala Gly Thr Val₂₀₀ Ala Lys Thr Tyr Gly₂₀₅ Ala Lys Val
 Tyr Gln₂₁₀ Met Gln Pro Glu Asn₂₁₅ Ile Phe Thr Val Ser₂₂₀ Val Met Pro Cys
 Thr Ser Lys Lys Leu Glu₂₃₀ Ala Ser Arg Pro Glu₂₃₅ Phe Asn Ser Ala Trp₂₄₀
 Gln Tyr His Gln Glu₂₄₅ His Gly Ala Asn Ser₂₅₀ Pro Ser Tyr Gln Asp₂₅₅ Ile
 Asp Ala Val Leu₂₆₀ Thr Thr Arg Glu Met₂₆₅ Ala Gln Leu Leu Lys₂₇₀ Leu Leu
 Asp Ile Asp₂₇₅ Leu Ala Asn Thr Ala₂₈₀ Glu Tyr Gln Gly Asp₂₈₅ Ser Leu Phe
 Ser Glu Tyr Thr Gly Ala Gly₂₉₅ Thr Ile Phe Gly Thr₃₀₀ Thr Gly Gly Val
 Met Glu Ala Ala Leu Arg₃₁₀ Thr Ala His Lys Val₃₁₅ Leu Thr Gly Thr Glu₃₂₀
 Met Ala Lys Leu Glu₃₂₅ Phe Glu Pro Val Arg₃₃₀ Gly Leu Lys Gly Val₃₃₅ Lys
 Ser Ala Ser Val₃₄₀ Ser Leu Phe Asp Thr₃₄₅ Glu Leu Asn Gln Asp₃₅₀ Val Thr
 Val Asn Val₃₅₅ Ala Val Val His Asp₃₆₀ Met Gly Asn Asn Ile₃₆₅ Glu Pro Val
 Leu Arg Asp Val Met Ala Gly₃₇₅ Thr Ser Pro Tyr His₃₈₀ Phe Ile Glu Val

Met Asn Cys Ala Gly Gly Cys Val Asn Gly Gly Gly Gln Pro Ile Glu
 385 390 395 400

Gly Lys Gly Ser Ser Trp Leu Gly Asn Ile
 405 410

<210> 86
 <211> 606
 <212> PRT
 <213> Clostridium thermocellum
 <400> 86

Met Ala Phe Val Trp Arg Asn Val Arg Ser Arg Pro Phe Pro Lys Lys
 1 5 10 15

Pro Asn Gly Arg Gly Cys Glu Lys Met Gln Met Val Asn Val Thr Ile
 20 25 30

Asp Asn Cys Lys Ile Gln Val Pro Ala Asn Tyr Thr Val Leu Glu Ala
 35 40 45

Ala Lys Gln Ala Asn Ile Asp Ile Pro Thr Leu Cys Phe Leu Lys Asp
 50 55 60

Ile Asn Glu Val Gly Ala Cys Arg Met Cys Val Val Glu Val Lys Gly
 65 70 75 80

Ala Arg Ser Leu Gln Ala Ala Cys Val Tyr Pro Val Ser Glu Gly Leu
 85 90 95

Glu Val Tyr Thr Gln Thr Pro Ala Val Arg Glu Ala Arg Lys Val Thr
 100 105 110

Leu Glu Leu Ile Leu Ser Asn His Glu Lys Lys Cys Leu Thr Cys Val
 115 120 125

Arg Ser Glu Asn Cys Glu Leu Gln Arg Leu Ala Lys Asp Leu Asn Val
 130 135 140

Lys Asp Ile Arg Phe Glu Gly Glu Met Ser Asn Leu Pro Ile Asp Asp
 145 150 155 160

Leu Ser Pro Ser Val Val Arg Asp Pro Asn Lys Cys Val Leu Cys Arg
 165 170 175

Arg Cys Val Ser Met Cys Lys Asn Val Gln Thr Val Gly Ala Ile Asp
 180 185 190

Val Thr Glu Arg Gly Phe Arg Thr Thr Val Ser Thr Ala Phe Asn Lys
 195 200 205

Pro Leu Ser Glu Val Pro Cys Val Asn Cys Gly Gln Cys Ile Asn Val
 210 215 220

060513 second sequence listing formatted.txt

Cys Pro Val Gly Ala Leu Arg Glu Lys Asp Asp Ile Asp Lys Val Trp
 225 230 235 240
 Glu Ala Leu Ala Asn Pro Glu Leu His Val Val Val Gln Thr Ala Pro
 245 250 255
 Ala Val Arg Val Ala Leu Gly Glu Glu Phe Gly Met Pro Ile Gly Ser
 260 265 270
 Arg Val Thr Gly Lys Met Val Ala Ala Leu Ser Arg Leu Gly Phe Lys
 275 280 285
 Lys Val Phe Asp Thr Asp Thr Ala Ala Asp Leu Thr Ile Met Glu Glu
 290 295 300
 Gly Thr Glu Leu Ile Asn Arg Ile Lys Asn Gly Gly Lys Leu Pro Leu
 305 310 315 320
 Ile Thr Ser Cys Ser Pro Gly Trp Ile Lys Phe Cys Glu His Asn Tyr
 325 330 335
 Pro Glu Phe Leu Asp Asn Leu Ser Ser Cys Lys Ser Pro His Glu Met
 340 345 350
 Phe Gly Ala Val Leu Lys Ser Tyr Tyr Ala Gln Lys Asn Gly Ile Asp
 355 360 365
 Pro Ser Lys Val Phe Val Val Ser Ile Met Pro Cys Thr Ala Lys Lys
 370 375 380
 Phe Glu Ala Gln Arg Pro Glu Leu Ser Ser Thr Gly Tyr Pro Asp Val
 385 390 395 400
 Asp Val Val Leu Thr Thr Arg Glu Leu Ala Arg Met Ile Lys Glu Thr
 405 410 415
 Gly Ile Asp Phe Asn Ser Leu Pro Asp Lys Gln Phe Asp Asp Pro Met
 420 425 430
 Gly Glu Ala Ser Gly Ala Gly Val Ile Phe Gly Ala Thr Gly Gly Val
 435 440 445
 Met Glu Ala Ala Ile Arg Thr Val Gly Glu Leu Leu Ser Gly Lys Pro
 450 455 460
 Ala Asp Lys Ile Glu Tyr Thr Glu Val Arg Gly Leu Asp Gly Ile Lys
 465 470 475 480
 Glu Ala Ser Ile Glu Leu Asp Gly Phe Thr Leu Lys Ala Ala Val Ala
 485 490 495
 His Gly Leu Gly Asn Ala Arg Lys Leu Leu Asp Lys Ile Lys Ala Gly

500

505

510

Glu Ala Asp Tyr His Phe Ile Glu Ile Met Ala Cys Pro Gly Gly Cys
 515 520 525

Ile Asn Gly Gly Gly Gln Pro Ile Gln Pro Ser Ser Val Arg Asn Trp
 530 535 540

Lys Asp Ile Arg Cys Glu Arg Ala Lys Ala Ile Tyr Glu Glu Asp Glu
 545 550 555 560

Ser Leu Pro Ile Arg Lys Ser His Glu Asn Pro Lys Ile Lys Met Leu
 565 570 575

Tyr Glu Glu Phe Phe Gly Glu Pro Gly Ser His Lys Ala His Glu Leu
 580 585 590

Leu His Thr His Tyr Glu Lys Arg Glu Asn Tyr Pro Val Lys
 595 600 605

<210> 87
 <211> 279
 <212> PRT
 <213> Desulfitobacterium hafniense

<400> 87

Met Thr Met Gly Gln Leu Arg Ala Ala Leu Lys His Leu Gly Phe Tyr
 1 5 10 15

Gly Met Ile Glu Val Ala Leu Phe Ala Asp Val Leu Ser Leu Lys Glu
 20 25 30

Ala Leu Glu Phe Asp Lys His Val Gln Thr Asp Lys Asp Phe Val Leu
 35 40 45

Thr Ser Cys Cys Cys Pro Ile Trp Val Gly Met Val Lys Arg Val Tyr
 50 55 60

Asp Thr Leu Val Pro His Ile Ser Pro Ser Val Ser Pro Met Val Ala
 65 70 75 80

Cys Gly Arg Gly Ile Lys Arg Leu His Pro Asp Ala Lys Thr Val Phe
 85 90 95

Ile Gly Pro Cys Ile Ala Lys Lys Ala Glu Ala Lys Glu Pro Asp Ile
 100 105 110

Arg Asp Ala Val Asp Ala Val Leu Thr Phe His Glu Leu Lys Gln Ile
 115 120 125

Phe Glu Ala Thr Asp Ile Glu Pro Ser Glu Met Glu Asp Ile Pro Ser
 130 135 140

Glu His Ser Ser Thr Ser Gly Arg Ile Tyr Ala Arg Thr Gly Gly Val
 145 150 155 160

Ser Lys Ser Ile Ser Asp Thr Leu Asn Arg Ile Arg Pro Asp Lys Pro
 165 170 175

Val Lys Ile Lys Ser Ile Gln Ala Asn Gly Ile Lys Glu Cys Lys Ala
 180 185 190

Leu Leu Asn Asp Ile Met Asn Asn Glu Ile Lys Ala Asn Phe Tyr Glu
 195 200 205

Gly Met Gly Cys Pro Gly Gly Cys Val Gly Gly Pro Lys Ala Ile Val
 210 215 220

Asp Val Asp Arg Gly Thr Glu Phe Val Asn Lys Tyr Gly Ala Glu Ala
 225 230 235 240

Asp Ala Leu Thr Pro Ala Asp Asn Gln His Val Leu Glu Leu Leu Lys
 245 250 255

Gln Leu Gly Ile Asp Ser Val Glu Glu Leu Leu Gly Gly Glu Ser Ala
 260 265 270

Ala Ile Phe Gln Arg Asp Phe
 275

<210> 88
 <211> 505
 <212> PRT
 <213> C. reinhardtii

<400> 88

Met Ala Leu Gly Leu Arg Ala Glu Leu Arg Ala Gly Gln Ala Val Ala
 1 5 10 15

Cys Ala Arg Arg Thr Asn Ala Pro Ala His Pro Ala Ala Val Val Pro
 20 25 30

Val Leu Pro Ser Arg Gly Asp Lys Phe Phe Asn Leu Ser Gln Lys Val
 35 40 45

Pro Ser Ser Gln Pro Ala Arg Gly Ser Thr Ile Arg Val Ala Ala Thr
 50 55 60

Ala Thr Asp Ala Val Pro His Trp Lys Leu Ala Leu Glu Glu Leu Asp
 65 70 75 80

Lys Pro Lys Asp Gly Gly Arg Lys Val Leu Ile Ala Gln Val Ala Pro
 85 90 95

Ala Val Arg Val Ala Ile Ala Glu Ser Phe Gly Leu Ala Pro Gly Ala
 100 105 110

060513 second sequence listing formatted.txt

Val Ser Pro Gly Lys Leu Ala Ala Gly Leu Arg Ala Leu Gly Phe Asp
115 120 125

Gln Val Phe Asp Thr Leu Phe Ala Ala Asp Leu Thr Ile Met Glu Glu
130 135 140

Gly Thr Glu Leu Leu His Arg Leu Lys Glu His Leu Glu Ala His Pro
145 150 155 160

His Ser Asp Glu Pro Leu Pro Met Phe Thr Ser Cys Cys Pro Gly Trp
165 170 175

Val Ala Met Met Glu Lys Ser Tyr Pro Glu Leu Ile Pro Phe Val Ser
180 185 190

Ser Cys Lys Ser Pro Gln Met Met Met Gly Ala Met Val Lys Thr Tyr
195 200 205

Leu Ser Glu Lys Gln Gly Ile Pro Ala Lys Asp Ile Val Met Val Ser
210 215 220

Val Met Pro Cys Val Arg Lys Gln Gly Glu Ala Asp Arg Glu Trp Phe
225 230 235 240

Cys Val Ser Glu Pro Gly Val Arg Asp Val Asp His Val Ile Thr Thr
245 250 255

Ala Glu Leu Gly Asn Ile Phe Lys Glu Arg Gly Ile Ile Leu Pro Glu
260 265 270

Leu Pro Asp Ser Asp Trp Asp Gln Pro Leu Gly Leu Gly Ser Gly Ala
275 280 285

Gly Val Leu Phe Gly Thr Thr Gly Gly Val Met Glu Ala Ala Val Arg
290 295 300

Thr Ala Tyr Glu Ile Val Thr Lys Glu Pro Leu Pro Arg Leu Asn Leu
305 310 315 320

Ser Glu Val Arg Gly Leu Asp Gly Ile Lys Glu Ala Ser Val Thr Leu
325 330 335

Val Pro Ala Pro Gly Ser Lys Phe Ala Glu Leu Val Ala Ala Arg Leu
340 345 350

Ala His Lys Val Glu Glu Ala Ala Ala Glu Ala Ala Ala Val
355 360 365

Glu Gly Ala Val Lys Pro Pro Ile Ala Tyr Asp Gly Gly Gln Gly Phe
370 375 380

Ser Thr Asp Asp Gly Lys Gly Gly Leu Lys Leu Arg Val Ala Val Ala

385

390

395

400

Asn Gly Leu Gly Asn Ala Lys Lys Leu Ile Gly Lys Met Val Ser Gly
 405 410 415

Glu Ala Lys Tyr Asp Phe Val Glu Ile Met Ala Cys Pro Ala Gly Cys
 420 425 430

Val Gly Gly Gly Gly Gln Pro Arg Ser Thr Asp Lys Gln Ile Thr Gln
 435 440 445

Lys Arg Gln Ala Ala Leu Tyr Asp Leu Asp Glu Arg Asn Thr Leu Arg
 450 455 460

Arg Ser His Glu Asn Glu Ala Val Asn Gln Leu Tyr Lys Glu Phe Leu
 465 470 475 480

Gly Glu Pro Leu Ser His Arg Ala His Glu Leu Leu His Thr His Tyr
 485 490 495

Val Pro Gly Gly Ala Glu Ala Asp Ala
 500 505

<210> 89
 <211> 505
 <212> PRT
 <213> C. reinhardtii

<400> 89

Met Ala Leu Gly Leu Arg Ala Glu Leu Arg Ala Gly Gln Ala Val Ala
 1 5 10 15

Cys Ala Arg Arg Thr Asn Ala Pro Ala His Pro Ala Ala Val Val Pro
 20 25 30

Val Leu Pro Ser Arg Gly Asp Lys Phe Phe Asn Leu Serⁱ Gln Lys Val
 35 40 45

Pro Ser Ser Gln Pro Ala Arg Gly Ser Thr Ile Arg Val Ala Ala Thr
 50 55 60

Ala Thr Asp Ala Val Pro His Trp Lys Leu Ala Leu Glu Glu Leu Asp
 65 70 75 80

Lys Pro Lys Asp Gly Gly Arg Lys Val Leu Ile Ala Gln Val Ala Pro
 85 90 95

Ala Val Arg Val Ala Ile Ala Glu Ser Phe Gly Leu Ala Pro Gly Ala
 100 105 110

Val Ser Pro Gly Lys Leu Ala Ala Gly Leu Arg Ala Leu Gly Phe Asp
 115 120 125

Gln Val Phe Asp Thr Leu Phe Ala Ala Asp Leu Thr Ile Met Glu Glu
 130 135 140
 Gly Thr Glu Leu Leu His Arg Leu Lys Glu His Leu Glu Ala His Pro
 145 150 155 160
 His Ser Asp Glu Pro Leu Pro Met Phe Thr Ser Cys Cys Pro Gly Trp
 165 170 175
 Val Ala Met Met Glu Lys Ser Tyr Pro Glu Leu Ile Pro Phe Val Ser
 180 185 190
 Ser Cys Lys Ser Pro Gln Met Met Met Gly Ala Met Val Lys Thr Tyr
 195 200 205
 Leu Ser Glu Lys Gln Gly Ile Pro Ala Lys Asp Ile Val Met Val Ser
 210 215 220
 Val Met Pro Cys Val Arg Lys Gln Gly Val Ala Asp Arg Glu Trp Phe
 225 230 235 240
 Cys Val Ser Glu Pro Gly Val Arg Asp Val Asp His Val Ile Thr Thr
 245 250 255
 Ala Glu Leu Gly Asn Ile Phe Lys Glu Arg Gly Ile Ile Leu Pro Glu
 260 265 270
 Leu Pro Asp Ser Asp Trp Asp Gln Pro Leu Gly Leu Gly Ser Gly Ala
 275 280 285
 Gly Val Leu Phe Gly Thr Thr Gly Gly Val Met Glu Ala Ala Val Arg
 290 295 300
 Thr Ala Tyr Glu Ile Val Thr Lys Glu Pro Leu Pro Arg Leu Asn Leu
 305 310 315 320
 Ser Glu Val Arg Gly Leu Asp Gly Ile Lys Glu Ala Ser Val Thr Leu
 325 330 335
 Val Pro Ala Pro Gly Ser Lys Phe Ala Glu Leu Val Ala Ala Arg Leu
 340 345 350
 Ala His Lys Val Glu Glu Ala Ala Ala Glu Ala Ala Ala Val
 355 360 365
 Glu Gly Ala Val Lys Pro Pro Ile Ala Tyr Asp Gly Gly Gln Gly Phe
 370 375 380
 Ser Thr Asp Asp Gly Lys Gly Gly Leu Lys Leu Arg Val Ala Val Ala
 385 390 395 400
 Asn Gly Leu Gly Asn Ala Lys Lys Leu Ile Gly Lys Met Val Ser Gly
 405 410 415

Glu Ala Lys Tyr Asp Phe Val Glu Ile Met Ala Cys Pro Ala Gly Cys
 420 425 430

Val Gly Gly Gly Gly Gln Pro Arg Ser Thr Asp Lys Gln Ile Thr Gln
 435 440 445

Lys Arg Gln Ala Ala Leu Tyr Asp Leu Asp Glu Arg Asn Thr Leu Arg
 450 455 460

Arg Ser His Glu Asn Glu Ala Val Asn Gln Leu Tyr Lys Glu Phe Leu
 465 470 475 480

Gly Glu Pro Leu Ser His Arg Ala His Glu Leu Leu His Thr His Tyr
 485 490 495

Val Pro Gly Gly Ala Glu Ala Asp Ala
 500 505

<210> 90
 <211> 608
 <212> PRT
 <213> T. maritima

<400> 90

Met Arg Arg Phe Phe Lys Asn Asn Leu Arg Asn Leu Ser Gln Asn Gly
 1 5 10 15

Glu Thr Asn Ser Val Arg Arg Cys Phe Ala Leu Ala Asp Val Thr Val
 20 25 30

Val Ile Asn Gly Arg Thr Leu Thr Val Pro Asp Asn Leu Thr Val Ile
 35 40 45

Glu Ala Cys Glu Lys Ala Gly Ile Glu Ile Pro Ala Leu Cys His His
 50 55 60

Pro Arg Leu Gly Glu Ser Ile Gly Ala Cys Arg Val Cys Val Val Glu
 65 70 75 80

Val Glu Gly Ala Arg Asn Leu Gln Pro Ala Cys Val Thr Lys Val Arg
 85 90 95

Asp Gly Met Val Ile Lys Thr Ser Ser Asp Arg Val Lys Thr Ala Arg
 100 105 110

Lys Phe Asn Leu Ala Leu Leu Leu Ser Glu His Pro Asn Asp Cys Met
 115 120 125

Thr Cys Glu Ala Asn Gly Arg Cys Glu Phe Gln Asp Leu Ile Tyr Lys
 130 135 140

Tyr Asp Val Glu Pro Ile Phe Gly Tyr Gly Thr Lys Glu Gly Leu Val

145					150					155					160
Asp	Arg	Ser	Ser	Pro	Ala	Ile	Val	Arg	Asp	Leu	Ser	Lys	Cys	Ile	Lys
				165					170					175	
Cys	Gln	Arg	Cys	Val	Arg	Ala	Cys	Ser	Glu	Leu	Gln	Gly	Met	His	Ile
			180					185					190		
Tyr	Ser	Met	Val	Glu	Arg	Gly	His	Arg	Thr	Tyr	Pro	Gly	Thr	Pro	Phe
		195					200					205			
Asp	Met	Pro	Val	Tyr	Glu	Thr	Asp	Cys	Ile	Gly	Cys	Gly	Gln	Cys	Ala
	210					215					220				
Ala	Phe	Cys	Pro	Thr	Gly	Ala	Ile	Val	Glu	Asn	Ser	Ala	Val	Lys	Val
225					230					235					240
Val	Leu	Glu	Glu	Leu	Glu	Lys	Lys	Glu	Lys	Ile	Leu	Val	Val	Gln	Thr
				245					250					255	
Ala	Pro	Ser	Val	Arg	Val	Ala	Ile	Gly	Glu	Glu	Phe	Gly	Tyr	Ala	Pro
			260					265					270		
Gly	Thr	Ile	Ser	Thr	Gly	Gln	Met	Val	Ala	Ala	Leu	Arg	Arg	Leu	Gly
		275					280					285			
Phe	Asp	Tyr	Val	Phe	Asp	Thr	Asn	Phe	Gly	Ala	Asp	Leu	Thr	Ile	Met
	290					295					300				
Glu	Glu	Gly	Ser	Glu	Phe	Leu	Glu	Arg	Leu	Glu	Lys	Gly	Asp	Leu	Glu
305					310					315					320
Asp	Leu	Pro	Met	Phe	Thr	Ser	Cys	Cys	Pro	Gly	Trp	Val	Asn	Leu	Val
				325					330					335	
Glu	Lys	Val	Tyr	Pro	Glu	Leu	Arg	Thr	Arg	Leu	Ser	Ser	Ala	Lys	Ser
			340					345					350		
Pro	Gln	Gly	Met	Leu	Ser	Ala	Met	Val	Lys	Thr	Tyr	Phe	Ala	Glu	Lys
		355					360					365			
Leu	Gly	Val	Lys	Pro	Glu	Asp	Ile	Phe	His	Val	Ser	Ile	Met	Pro	Cys
	370					375					380				
Thr	Ala	Lys	Lys	Asp	Glu	Ala	Leu	Arg	Lys	Gln	Leu	Met	Val	Asn	Gly
385					390					395					400
Val	Pro	Ala	Val	Asp	Val	Val	Leu	Thr	Thr	Arg	Glu	Leu	Gly	Lys	Leu
				405					410					415	
Ile	Arg	Met	Lys	Lys	Ile	Pro	Phe	Ala	Asn	Leu	Pro	Glu	Glu	Glu	Tyr
			420					425					430		

060513 second sequence listing formatted.txt

Asp Ala Pro Leu Gly Ile Ser Thr Gly Ala Ala Ala Leu Phe Gly Val
435 440 445

Thr Gly Gly Val Met Glu Ala Ala Leu Arg Thr Ala Tyr Glu Leu Lys
450 455 460

Thr Gly Lys Ala Leu Pro Lys Ile Val Phe Glu Glu Val Arg Gly Leu
465 470 475 480

Lys Gly Val Arg Glu Ala Glu Ile Asp Leu Asp Gly Lys Lys Ile Arg
485 490 495

Ile Ala Val Val His Gly Thr Ala Asn Val Arg Asn Leu Val Glu Lys
500 505 510

Ile Leu Arg Arg Glu Val Lys Tyr His Phe Val Glu Val Met Ala Cys
515 520 525

Pro Gly Gly Cys Ile Gly Gly Gly Gly Gln Pro Tyr Ser Arg Asp Pro
530 535 540

Glu Ile Leu Arg Lys Arg Ala Glu Ala Ile Tyr Thr Ile Asp Glu Arg
545 550 555 560

Met Thr Leu Arg Lys Ser His Glu Asn Pro Ala Ile Lys Lys Leu Tyr
565 570 575

Glu Glu Tyr Leu Glu His Pro Leu Ser His Lys Ala His Glu Leu Leu
580 585 590

His Thr Tyr Tyr Glu Asp Arg Ser Arg Lys Lys Arg Leu Ala Val Lys
595 600 605

<210> 91
<211> 497
<212> PRT
<213> C. reinhardtii

<400> 91

Met Ser Ala Leu Val Leu Lys Pro Cys Ala Ala Val Ser Ile Arg Gly
1 5 10 15

Ser Ser Cys Arg Ala Arg Gln Val Ala Pro Arg Ala Pro Leu Ala Ala
20 25 30

Ser Thr Val Arg Val Ala Leu Ala Thr Leu Glu Ala Pro Ala Arg Arg
35 40 45

Leu Gly Asn Val Ala Cys Ala Ala Ala Ala Pro Ala Ala Glu Ala Pro
50 55 60

Leu Ser His Val Gln Gln Ala Leu Ala Glu Leu Ala Lys Pro Lys Asp
65 70 75 80

060513 second sequence listing formatted.txt

Asp Pro Thr Arg Lys His Val Cys Val Gln Val Ala Pro Ala Val Arg
 85 90 95
 Val Ala Ile Ala Glu Thr Leu Gly Leu Ala Pro Gly Ala Thr Thr Pro
 100 105 110
 Lys Gln Leu Ala Glu Gly Leu Arg Arg Leu Gly Phe Asp Glu Val Phe
 115 120 125
 Asp Thr Leu Phe Gly Ala Asp Leu Thr Ile Met Glu Glu Gly Ser Glu
 130 135 140
 Leu Leu His Arg Leu Thr Glu His Leu Glu Ala His Pro His Ser Asp
 145 150 155 160
 Glu Pro Leu Pro Met Phe Thr Ser Cys Cys Pro Gly Trp Ile Ala Met
 165 170 175
 Leu Glu Lys Ser Tyr Pro Asp Leu Ile Pro Tyr Val Ser Ser Cys Lys
 180 185 190
 Ser Pro Gln Met Met Leu Ala Ala Met Val Lys Ser Tyr Leu Ala Glu
 195 200 205
 Lys Lys Gly Ile Ala Pro Lys Asp Met Val Met Val Ser Ile Met Pro
 210 215 220
 Cys Thr Arg Lys Gln Ser Glu Ala Asp Arg Asp Trp Phe Cys Val Asp
 225 230 235 240
 Ala Asp Pro Thr Leu Arg Gln Leu Asp His Val Ile Thr Thr Val Glu
 245 250 255
 Leu Gly Asn Ile Phe Lys Glu Arg Gly Ile Asn Leu Ala Glu Leu Pro
 260 265 270
 Glu Gly Glu Trp Asp Asn Pro Met Gly Val Gly Ser Gly Ala Gly Val
 275 280 285
 Leu Phe Gly Thr Thr Gly Gly Val Met Glu Ala Ala Leu Arg Thr Ala
 290 295 300
 Tyr Glu Leu Phe Thr Gly Thr Pro Leu Pro Arg Leu Ser Leu Ser Glu
 305 310 315 320
 Val Arg Gly Met Asp Gly Ile Lys Glu Thr Asn Ile Thr Met Val Pro
 325 330 335
 Ala Pro Gly Ser Lys Phe Glu Glu Leu Leu Lys His Arg Ala Ala Ala
 340 345 350

Arg Ala Glu Ala Ala Ala His Gly Thr Pro Gly Pro Leu Ala Trp Asp
 355 360 365

Gly Gly Ala Gly Phe Thr Ser Glu Asp Gly Arg Gly Gly Ile Thr Leu
 370 375 380

Arg Val Ala Val Ala Asn Gly Leu Gly Asn Ala Lys Lys Leu Ile Thr
 385 390 395 400

Lys Met Gln Ala Gly Glu Ala Lys Tyr Asp Phe Val Glu Ile Met Ala
 405 410 415

Cys Pro Ala Gly Cys Val Gly Gly Gly Gly Gln Pro Arg Ser Thr Asp
 420 425 430

Lys Ala Ile Thr Gln Lys Arg Gln Ala Ala Leu Tyr Asn Leu Asp Glu
 435 440 445

Lys Ser Thr Leu Arg Arg Ser His Glu Asn Pro Ser Ile Arg Glu Leu
 450 455 460

Tyr Asp Thr Tyr Leu Gly Glu Pro Leu Gly His Lys Ala His Glu Leu
 465 470 475 480

Leu His Thr His Tyr Val Ala Gly Gly Val Glu Glu Lys Asp Glu Lys
 485 490 495

Lys

<210> 92
 <211> 581
 <212> PRT
 <213> T. tencongensis

<400> 92

Met Asp Lys Val Arg Val Thr Ile Asp Gly Ile Thr Val Glu Val Pro
 1 5 10 15

Ser Tyr Tyr Thr Val Leu Glu Ala Ala Lys Glu Ala Gly Ile Asp Ile
 20 25 30

Pro Thr Leu Cys Tyr Leu Lys Glu Ile Asn Gln Ile Gly Ala Cys Arg
 35 40 45

Ile Cys Leu Val Glu Ile Glu Gly Val Arg Asn Leu Gln Thr Ser Cys
 50 55 60

Thr Tyr Pro Val Phe Asp Gly Met Lys Val Tyr Thr Asn Thr Pro Lys
 65 70 75 80

Ile Arg Glu Ala Arg Arg Leu Asn Leu Glu Leu Ile Leu Ser Asn His
 85 90 95

060513 second sequence listing formatted.txt

Asp Arg Asn Cys₁₀₀ Leu Thr Cys Val₁₀₅ Arg Ser Thr Asn Cys Glu₁₁₀ Leu Gln
Ala Leu Ala₁₁₅ Lys Arg Leu Gly Val₁₂₀ Glu Glu Ile Arg Phe₁₂₅ Glu Gly Glu
Asn Ile₁₃₀ Lys Tyr Pro Ile Asp₁₃₅ Asp Ala Ser Pro Ala₁₄₀ Val Val Arg Asp
Pro₁₄₅ Asn Lys Cys Val₁₅₀ Leu Cys Arg Arg Cys Val₁₅₅ Ala Val Cys Ser Glu₁₆₀
Val Gln Asn Val Phe₁₆₅ Ala Ile Gly Met Val₁₇₀ Asn Arg Gly Phe Lys₁₇₅ Thr
Met Val Ala₁₈₀ Pro Ser Phe Gly Arg Ser₁₈₅ Leu Lys Asp Ser Pro₁₉₀ Cys Ile
Ser Cys Gly₁₉₅ Gln Cys Ile Met Val₂₀₀ Cys Pro Val Gly Ala₂₀₅ Ile Tyr Glu
Lys Asp₂₁₀ His Thr Lys Arg Val₂₁₅ Tyr Glu Ala Leu Ala₂₂₀ Asp Asp Lys Lys
Tyr Val Val Ala Gln Thr₂₃₀ Ala Pro Ala Val Arg₂₃₅ Val Ala Leu Gly Glu₂₄₀
Glu Phe Gly Met Pro₂₄₅ Val Gly Thr Ile Val₂₅₀ Thr Gly Lys Met Ala₂₅₅ Ala
Ala Leu Arg Arg₂₆₀ Met Gly Phe Asp Ala₂₆₅ Val Phe Asp Thr Asn₂₇₀ Phe Ala
Ala Asp Leu₂₇₅ Thr Ile Met Glu Glu Gly Ser Glu Leu Leu₂₈₅ Glu Arg Ile
Lys His₂₉₀ Gly Gly Lys Leu Pro₂₉₅ Met Ile Thr Ser Cys₃₀₀ Ser Pro Gly Trp
Ile Ala Phe Cys Glu Lys₃₁₀ Tyr Tyr Pro Glu Phe₃₁₅ Ile Asp Asn Leu Ser₃₂₀
Thr Cys Lys Ser Pro₃₂₅ His Met Met Met Gly₃₃₀ Ala Leu Val Lys Ser₃₃₅ Tyr
Tyr Ala Glu Lys₃₄₀ Lys Gly Leu Asp Pro₃₄₅ Lys Asp Ile Phe Val₃₅₀ Val Ser
Ile Met Pro₃₅₅ Cys Thr Ala Lys Lys₃₆₀ Leu Glu Ile Glu Arg₃₆₅ Glu Glu Met
Ile Arg Asn Gly Met Lys Asp Val Asp Ala Val Leu Thr Thr Arg Glu

370

375

380

Leu Ala Arg Met Ile Lys Glu Met Gly Ile Asp Phe Val Asn Leu Lys
385 390 395 400

Asp Glu Glu Phe Asp Glu Pro Leu Gly Met Ser Thr Gly Ala Gly Ala
405 410 415

Ile Phe Gly Ala Thr Gly Gly Val Met Glu Ala Ala Leu Arg Thr Val
420 425 430

Ala Glu Ile Val Glu Gly Arg Asp Ile Gly Lys Ile Asp Phe Glu Glu
435 440 445

Val Arg Gly Leu Glu Gly Val Arg Glu Ala Thr Ile Thr Ile Asp Gly
450 455 460

Met Asp Ile Lys Ile Ala Ile Ala Asn Gly Thr Gly Asn Ala Lys Lys
465 470 475 480

Leu Leu Asp Lys Val Lys Ala Gly Glu Val Glu Tyr His Phe Ile Glu
485 490 495

Val Met Gly Cys Pro Gly Gly Cys Ile Met Gly Gly Gly Gln Pro Ile
500 505 510

His Asn Pro Asn Glu Met Glu Glu Val Lys Lys Leu Arg Ala Lys Ala
515 520 525

Ile Tyr Glu Ile Asp Lys Asn Leu Pro Ile Arg Lys Ser His Glu Asn
530 535 540

Pro Ala Ile Lys Arg Leu Tyr Glu Glu Phe Leu Gly Tyr Pro Leu Ser
545 550 555 560

Glu Lys Ser His Glu Leu Leu His Thr His Tyr Ser Arg Lys Glu Leu
565 570 575

Tyr Pro Leu Val Lys
580

<210> 93
<211> 636
<212> PRT
<213> N. frontalis

<400> 93

Met Ser Met Leu Ser Ser Val Leu Asn Lys Ala Val Val Asn Pro Lys
1 5 10 15

Leu Thr Arg Ser Leu Ala Thr Ala Ala Ala Glu Lys Met Val Asn Ile
20 25 30

Ser Ile Asn Gly Arg Lys Phe Gln Val Lys Pro Lys Thr Thr Val Leu
 35 40 45
 Glu Ala Ala Lys Ala Asn Gly Tyr Tyr Ile Pro Thr Leu Cys Tyr His
 50 55 60
 Gln Glu Leu Pro Val Ala Gly Asn Cys Arg Leu Cys Leu Val Tyr Ala
 65 70 75 80
 Lys Gly Ser Trp Lys Pro Leu Thr Ala Cys Thr Thr Glu Val Trp Glu
 85 90 95
 Gly Met Glu Ile Glu Thr Asp Ser Pro Ala Val Ile Glu Thr Val Arg
 100 105 110
 Ser Ser Leu Ser Met Met Arg Glu Glu His Pro Asn Asp Cys Met Thr
 115 120 125
 Cys Gly Ser Asn Gly Asp Cys Glu Phe Gln Asp Leu Ile Tyr Arg Tyr
 130 135 140
 Gln Ile Asp Ala Lys His Pro Val Arg Ser Leu Leu Lys His Lys Ser
 145 150 155 160
 Lys Lys Thr Asn His Ser Ile Thr Glu Pro Cys Tyr Ser Pro Phe Asp
 165 170 175
 Asn Thr Thr Phe Ser Val Ala Arg Asp Met Asn Lys Cys Val Lys Cys
 180 185 190
 Gly Arg Cys Ile Arg Ala Cys His His Phe Gln Asn Ile Asn Ile Leu
 195 200 205
 Gly Phe Ile Asn Arg Ala Gly Tyr Glu Arg Val Gly Thr Pro Met Asp
 210 215 220
 Arg Pro Met Asn Phe Thr Lys Cys Val Glu Cys Gly Gln Cys Ser Gln
 225 230 235 240
 Val Cys Pro Val Gly Ala Ile Thr Ala Arg Thr Glu Val Val Asp Val
 245 250 255
 Leu Arg His Leu Asp Thr Lys Arg Lys Val Val Val Cys Ser Thr Ala
 260 265 270
 Pro Ala Ile Arg Val Ala Pro Ala Glu Glu Phe Ser Thr Glu Ala Asp
 275 280 285
 Phe Asp Phe Thr Gly Lys Met Val Ala Gly Leu Arg Lys Leu Gly Phe
 290 295 300
 Asp Tyr Ile Phe Asp Thr Asn Phe Ser Ala Asp Leu Thr Ile Met Glu
 305 310 315 320

060513 second sequence listing formatted.txt

Glu Gly Thr Glu Leu Ile Asp Arg Leu Asn Asn Gly Gly Lys Phe Pro
325 330 335

Met Phe Thr Ser Cys Cys Pro Gly Trp Ile Asn Met Val Glu Lys Ser
340 345 350

Tyr Pro Glu Leu Ser Asp Asn Leu Ser Ser Cys Lys Ser Pro Gln Gln
355 360 365

Met Ile Gly Ala Val Ile Lys Ser Tyr Phe Ala Lys Lys Leu Gly Leu
370 375 380

Ser Thr Glu Asp Ile Ile His Val Ser Ile Met Pro Cys Thr Ala Lys
385 390 395 400

Lys Gly Glu Ala Arg Arg Pro Glu Phe Val Gln Lys Gly Lys Asp Gly
405 410 415

Lys Asp Tyr Pro Asp Ile Asp Tyr Val Ile Thr Thr Arg Glu Leu Leu
420 425 430

Thr Leu Leu Lys Leu Lys Lys Ile Asn Pro Ala Glu Leu Pro Asp Asp
435 440 445

Lys Phe Asp Ser Pro Leu Gly Ile Gly Ser Ser Ala Gly Asn Leu Phe
450 455 460

Gly Val Thr Gly Gly Val Met Glu Ala Ala Ile Arg Thr Ala Gln Val
465 470 475 480

Ile Thr Gly Val Glu Asn Pro Ile Pro Leu Gly Glu Leu Lys Ala Ile
485 490 495

Arg Gly Leu Asp Gly Ile Lys Ala Ala Asn Val Pro Leu Lys Thr Lys
500 505 510

Asp Gly Lys Glu Val Ser Val Arg Ala Ala Val Val Ser Gly Gly Ala
515 520 525

Asn Ile Gln Lys Phe Leu Glu Lys Ile Lys Asn Lys Glu Leu Glu Phe
530 535 540

Asp Phe Ile Glu Met Met Met Cys Pro Gly Gly Cys Ile Asn Gly Gly
545 550 555 560

Gly Gln Pro Lys Ser Ala Asp Pro Glu Ile Val Ala Lys Lys Met Gln
565 570 575

Arg Met Tyr Thr Met Asp Asp Gln Ala Lys Leu Arg Leu Cys His Glu
580 585 590

Asn Pro Glu Ile Ile Asp Val Tyr Lys Asn Phe Leu Gly Glu Pro Asn
 595 600 605

Ser His Leu Ala His Glu Leu Leu His Thr His Tyr Asn Asp Arg Ser
 610 615 620

Lys Thr Ile His Asp Met Gly His His Glu Lys Lys
 625 630 635

<210> 94

<211> 579

<212> PRT

<213> C. thermocellum

<400> 94

Met Val Asn Val Thr Ile Asp Asn Cys Lys Ile Gln Val Pro Ala Asn
 1 5 10 15

Tyr Thr Val Leu Glu Ala Ala Lys Gln Ala Asn Ile Asp Ile Pro Thr
 20 25 30

Leu Cys Phe Leu Lys Asp Ile Asn Glu Val Gly Ala Cys Arg Met Cys
 35 40 45

Val Val Glu Val Lys Gly Ala Arg Ser Leu Gln Ala Ala Cys Val Tyr
 50 55 60

Pro Val Ser Glu Gly Leu Glu Val Tyr Thr Gln Thr Pro Ala Val Arg
 65 70 75 80

Glu Ala Arg Lys Val Thr Leu Glu Leu Ile Leu Ser Asn His Glu Lys
 85 90 95

Lys Cys Leu Thr Cys Val Arg Ser Glu Asn Cys Glu Leu Gln Arg Leu
 100 105 110

Ala Lys Asp Leu Asn Val Lys Asp Ile Arg Phe Glu Gly Glu Met Ser
 115 120 125

Asn Leu Pro Ile Asp Asp Leu Ser Pro Ser Val Val Arg Asp Pro Asn
 130 135 140

Lys Cys Val Leu Cys Arg Arg Cys Val Ser Met Cys Lys Asn Val Gln
 145 150 155 160

Thr Val Gly Ala Ile Asp Val Thr Glu Arg Gly Phe Arg Thr Thr Val
 165 170 175

Ser Thr Ala Phe Asn Lys Pro Leu Ser Glu Val Pro Cys Val Asn Cys
 180 185 190

Gly Gln Cys Ile Asn Val Cys Pro Val Gly Ala Leu Arg Glu Lys Asp
 195 200 205

060513 second sequence listing formatted.txt

Asp Ile Asp Lys Val Trp Glu Ala Leu Ala Asn Pro Glu Leu His Val
 210 215 220
 Val Val Gln Thr Ala Pro Ala Val Arg Val Ala Leu Gly Glu Glu Phe
 225 230 235 240
 Gly Met Pro Ile Gly Ser Arg Val Thr Gly Lys Met Val Ala Ala Leu
 245 250 255
 Ser Arg Leu Gly Phe Lys Lys Val Phe Asp Thr Asp Thr Ala Ala Asp
 260 265 270
 Leu Thr Ile Met Glu Glu Gly Thr Glu Leu Ile Asn Arg Ile Lys Asn
 275 280 285
 Gly Gly Lys Leu Pro Leu Ile Thr Ser Cys Ser Pro Gly Trp Ile Lys
 290 295 300
 Phe Cys Glu His Asn Tyr Pro Glu Phe Leu Asp Asn Leu Ser Ser Cys
 305 310 315 320
 Lys Ser Pro His Glu Met Phe Gly Ala Val Leu Lys Ser Tyr Tyr Ala
 325 330 335
 Gln Lys Asn Gly Ile Asp Pro Ser Lys Val Phe Val Gly Ser Ile Met
 340 345 350
 Pro Cys Thr Ala Lys Lys Phe Glu Ala Gln Arg Pro Glu Leu Ser Ser
 355 360 365
 Thr Gly Tyr Pro Asp Val Asp Val Val Leu Thr Thr Arg Glu Leu Ala
 370 375 380
 Arg Met Ile Lys Glu Thr Gly Ile Asp Phe Asn Ser Leu Pro Asp Lys
 385 390 395 400
 Gln Phe Asp Asp Pro Met Gly Glu Ala Ser Gly Ala Gly Val Ile Phe
 405 410 415
 Gly Ala Thr Gly Gly Val Met Glu Ala Ala Ile Arg Thr Val Gly Glu
 420 425 430
 Leu Leu Ser Gly Lys Pro Ala Asp Lys Ile Glu Tyr Thr Glu Val Arg
 435 440 445
 Gly Leu Asp Gly Ile Lys Glu Ala Ser Ile Glu Leu Asp Gly Phe Thr
 450 455 460
 Leu Lys Ala Ala Val Ala His Gly Leu Gly Asn Ala Arg Lys Leu Leu
 465 470 475 480
 Asp Lys Ile Lys Ala Gly Glu Ala Asp Tyr His Phe Ile Glu Ile Met

Ala Cys Pro Gly Gly Cys Ile Asn Gly Gly Gly Gln Pro Ile Gln Pro
500 505 510

Ser Ser Val Arg Asn Trp Lys Asp Ile Arg Cys Glu Arg Ala Lys Ala
515 520 525

Ile Tyr Glu Glu Asp Glu Ser Leu Pro Ile Arg Lys Ser His Glu Asn
530 535 540

Pro Lys Ile Lys Met Leu Tyr Glu Glu Phe Phe Gly Glu Pro Gly Ser
545 550 555 560

His Lys Ala His Glu Leu Leu His Thr His Tyr Glu Lys Arg Glu Asn
565 570 575

Tyr Pro Val

<210> 95
<211> 588
<212> PRT
<213> B. thetaoimicron

<400> 95

Met Glu Glu Lys Gln Ile Thr Leu Gln Ile Asp Gly His Phe Ile Thr
1 5 10 15

Val Pro Glu Gly Ser Thr Ile Leu Glu Ala Ala Cys Lys Ile Gly Ile
20 25 30

Asn Ile Pro Thr Leu Cys His Ile Asp Leu Lys Gly Thr Cys Ile Lys
35 40 45

Asn Asn Pro Ala Ser Cys Arg Ile Cys Val Val Glu Val Ala Gly Arg
50 55 60

Arg Asn Leu Ala Pro Ala Cys Ala Thr Arg Cys Thr Glu Gly Met Val
65 70 75 80

Val Lys Thr Ser Thr Leu Arg Val Met Asn Ala Arg Lys Val Val Ala
85 90 95

Glu Leu Ile Leu Ser Asp His Pro Asn Asp Cys Leu Thr Cys Pro Lys
100 105 110

Cys Gly Asn Cys Glu Leu Gln Thr Leu Ala Leu Arg Phe Asn Ile Arg
115 120 125

Glu Met Pro Phe Asn Gly Gly Glu Leu Ser Pro Arg Lys Arg Glu Val
130 135 140

Thr Ser Ser Ile Val Arg Asn Met Asp Lys Cys Ile Phe Cys Arg Arg
 145 150 155 160
 Cys Glu Ser Val Cys Asn Asp Val Gln Thr Val Gly Ala Leu Gly Ala
 165 170 175
 Ile Arg Arg Gly Phe Asn Thr Thr Ile Ala Pro Ala Phe Asp Arg Met
 180 185 190
 Met Lys Asp Ser Glu Cys Thr Tyr Cys Gly Gln Cys Val Ala Val Cys
 195 200 205
 Pro Val Gly Ala Leu Thr Glu Arg Asp Tyr Thr Asn Arg Leu Leu Asp
 210 215 220
 Asp Leu Ala Asp Pro Asp Lys Ile Val Ile Val Gln Thr Ala Pro Ala
 225 230 235 240
 Val Arg Ala Ala Leu Gly Glu Glu Phe Gly Leu Pro Pro Gly Thr Leu
 245 250 255
 Val Thr Gly Lys Met Val Tyr Ala Leu Arg Glu Leu Gly Phe Asp Tyr
 260 265 270
 Val Phe Asp Thr Asp Phe Ala Ala Asp Leu Thr Ile Met Glu Glu Gly
 275 280 285
 Ser Glu Ile Leu Asn Arg Leu Thr Arg Tyr Leu Asp Gly Asp Lys Ser
 290 295 300
 Val Arg Leu Pro Ile Leu Thr Ser Cys Cys Pro Ala Trp Val Asn Phe
 305 310 315 320
 Phe Glu His His Phe Pro Asp Met Leu Asp Ile Pro Ser Thr Ala Arg
 325 330 335
 Ser Pro Gln Gln Met Phe Gly Ser Ile Ala Lys Ser Tyr Trp Ala Glu
 340 345 350
 Lys Met Gly Ile Pro Arg Glu Lys Leu Val Val Val Ser Ile Met Pro
 355 360 365
 Cys Leu Ala Lys Lys Tyr Glu Cys Asp Arg Asp Glu Phe Lys Val Asn
 370 375 380
 Gly Val Pro Asp Val Asp Tyr Ser Ile Ser Thr Arg Glu Leu Ala Arg
 385 390 395 400
 Leu Ile Lys Arg Ala Asn Ile Gly Phe Thr Leu Val Leu Asp Ser Pro
 405 410 415
 Phe Asp Asn Pro Met Gly Glu Ser Thr Gly Ala Gly Val Ile Phe Gly
 420 425 430

060513 second sequence listing formatted.txt

Thr Thr Gly Gly Val Met Glu Ala Ala Leu Arg Ser Val Tyr Glu Ile
435 440 445

Tyr Thr Gly Gln Pro Leu Lys Asn Val Asn Phe Glu Gln Val Arg Gly
450 455 460

Leu Ser Gly Val Arg Arg Ala Thr Ile Asp Leu Asn Gly Phe Glu Leu
465 470 475 480

Lys Val Gly Ile Ala His Gly Leu Gly Asn Ala Arg His Leu Leu Glu
485 490 495

Asp Ile Arg Asn Gly His Asn Glu Tyr His Val Ile Glu Ile Met Ala
500 505 510

Cys Pro Gly Gly Cys Ile Gly Gly Gly Gly Gln Pro Leu His His Gly
515 520 525

Asn Ser Asp Val Leu Tyr Ala Arg Ala Asn Ala Leu Tyr Arg Glu Asp
530 535 540

Ala Asn Lys Pro Leu Arg Lys Ser His Asp Asn Pro Tyr Ile Gln Lys
545 550 555 560

Leu Tyr Glu Glu Tyr Leu Gly Lys Pro Leu Gly Glu Lys Ser Glu Met
565 570 575

Leu Leu His Thr His Tyr Phe Asn Lys Ser Ile Asp
580 585

<210> 96
<211> 585
<212> PRT
<213> D. fructosovorans

<400> 96

Met Ser Met Leu Thr Ile Thr Ile Asp Gly Lys Thr Thr Ser Val Pro
1 5 10 15

Glu Gly Ser Thr Ile Leu Asp Ala Ala Lys Thr Leu Asp Ile Asp Ile
20 25 30

Pro Thr Leu Cys Tyr Leu Asn Leu Glu Ala Leu Ser Ile Asn Asn Lys
35 40 45

Ala Ala Ser Cys Arg Val Cys Val Val Glu Val Glu Gly Arg Arg Asn
50 55 60

Leu Ala Pro Ser Cys Ala Thr Pro Val Thr Asp Asn Met Val Val Lys
65 70 75 80

Thr Asn Ser Leu Arg Val Leu Asn Ala Arg Arg Thr Val Leu Glu Leu
Page 169

Leu Leu Ser Asp His Pro Lys Asp Cys Leu Val Cys Ala Lys Ser Gly
100 105 110

Glu Cys Glu Leu Gln Thr Leu Ala Glu Arg Phe Gly Ile Arg Glu Ser
115 120 125

Pro Tyr Asp Gly Gly Glu Met Ser His Tyr Arg Lys Asp Ile Ser Ala
130 135 140

Ser Ile Ile Arg Asp Met Asp Lys Cys Ile Met Cys Arg Arg Cys Glu
145 150 155 160

Thr Met Cys Asn Thr Val Gln Thr Cys Gly Val Leu Ser Gly Val Asn
165 170 175

Arg Gly Phe Thr Ala Val Val Ala Pro Ala Phe Glu Met Asn Leu Ala
180 185 190

Asp Thr Val Cys Thr Asn Cys Gly Gln Cys Val Ala Val Cys Pro Thr
195 200 205

Gly Ala Leu Val Glu His Glu Tyr Ile Trp Glu Val Val Glu Ala Leu
210 215 220

Ala Asn Pro Asp Lys Val Val Ile Val Gln Thr Ala Pro Ala Val Arg
225 230 235 240

Ala Ala Leu Gly Glu Asp Leu Gly Val Ala Pro Gly Thr Ser Val Thr
245 250 255

Gly Lys Met Ala Ala Ala Leu Arg Arg Leu Gly Phe Asp His Val Phe
260 265 270

Asp Thr Asp Phe Ala Ala Asp Leu Thr Ile Met Glu Glu Gly Ser Glu
275 280 285

Phe Leu Asp Arg Leu Gly Lys His Leu Ala Gly Asp Thr Asn Val Lys
290 295 300

Leu Pro Ile Leu Thr Ser Cys Cys Pro Gly Trp Val Lys Phe Phe Glu
305 310 315 320

His Gln Phe Pro Asp Met Leu Asp Val Pro Ser Thr Ala Lys Ser Pro
325 330 335

Gln Gln Met Phe Gly Ala Ile Ala Lys Thr Tyr Tyr Ala Asp Leu Leu
340 345 350

Gly Ile Pro Arg Glu Lys Leu Val Val Val Ser Val Met Pro Cys Leu
355 360 365

060513 second sequence listing formatted.txt

Ala Lys Lys Tyr Glu Cys Ala Arg Pro Glu Phe Ser Val Asn Gly Asn
370 375 380

Pro Asp Val Asp Ile Val Ile Thr Thr Arg Glu Leu Ala Lys Leu Val
385 390 395 400

Lys Arg Met Asn Ile Asp Phe Ala Gly Leu Pro Asp Glu Asp Phe Asp
405 410 415

Ala Pro Leu Gly Ala Ser Thr Gly Ala Ala Pro Ile Phe Gly Val Thr
420 425 430

Gly Gly Val Ile Glu Ala Ala Leu Arg Thr Ala Tyr Glu Leu Ala Thr
435 440 445

Gly Glu Thr Leu Lys Lys Val Asp Phe Glu Asp Val Arg Gly Met Asp
450 455 460

Gly Val Lys Lys Ala Lys Val Lys Val Gly Asp Asn Glu Leu Val Ile
465 470 475 480

Gly Val Ala His Gly Leu Gly Asn Ala Arg Glu Leu Leu Lys Pro Cys
485 490 495

Gly Ala Gly Glu Thr Phe His Ala Ile Glu Val Met Ala Cys Pro Gly
500 505 510

Gly Cys Ile Gly Gly Gly Gly Gln Pro Tyr His His Gly Asp Val Glu
515 520 525

Leu Leu Lys Lys Arg Thr Gln Val Leu Tyr Ala Glu Asp Ala Gly Lys
530 535 540

Pro Leu Arg Lys Ser His Glu Asn Pro Tyr Ile Ile Glu Leu Tyr Glu
545 550 555 560

Lys Phe Leu Gly Lys Pro Leu Ser Glu Arg Ser His Gln Leu Leu His
565 570 575

Thr His Tyr Phe Lys Arg Gln Arg Leu
580 585

<210> 97
<211> 606
<212> PRT
<213> D. vulgaris

<400> 97

Met Asn Ala Phe Ile Asn Gly Lys Glu Val Arg Cys Glu Pro Gly Arg
1 5 10 15

Thr Ile Leu Glu Ala Ala Arg Glu Asn Gly His Phe Ile Pro Thr Leu
20 25 30

Cys Glu Leu Ala Asp Ile Gly His Ala Pro Gly Thr Cys Arg Val Cys
 35 40 45
 Leu Val Glu Ile Trp Arg Asp Lys Glu Ala Gly Pro Gln Ile Val Thr
 50 55 60
 Ser Cys Thr Thr Pro Val Glu Glu Gly Met Arg Ile Phe Thr Arg Thr
 65 70 75 80
 Pro Glu Val Arg Arg Met Gln Arg Leu Gln Val Glu Leu Leu Leu Ala
 85 90 95
 Asp His Asp His Asp Cys Ala Ala Cys Ala Arg His Gly Asp Cys Glu
 100 105 110
 Leu Gln Asp Val Ala Gln Phe Val Gly Leu Thr Gly Thr Arg His His
 115 120 125
 Phe Pro Asp Tyr Ala Arg Ser Arg Thr Arg Asp Val Ser Ser Pro Ser
 130 135 140
 Val Val Arg Asp Met Gly Lys Cys Ile Arg Cys Leu Arg Cys Val Ala
 145 150 155 160
 Val Cys Arg Asn Val Gln Gly Val Asp Ala Leu Val Val Thr Gly Asn
 165 170 175
 Gly Ile Gly Thr Glu Ile Gly Leu Arg His Asn Arg Ser Gln Ser Ala
 180 185 190
 Ser Asp Cys Val Gly Cys Gly Gln Cys Thr Leu Val Cys Pro Val Gly
 195 200 205
 Ala Leu Ala Gly Arg Asp Asp Val Glu Arg Val Ile Asp Tyr Leu Tyr
 210 215 220
 Asp Pro Glu Ile Val Thr Val Phe Gln Phe Ala Pro Ala Val Arg Val
 225 230 235 240
 Gly Leu Gly Glu Glu Phe Gly Leu Pro Pro Gly Ser Ser Val Glu Gly
 245 250 255
 Gln Val Pro Thr Ala Leu Arg Leu Leu Gly Ala Asp Val Val Leu Asp
 260 265 270
 Thr Asn Phe Ala Ala Asp Leu Val Ile Met Glu Glu Gly Thr Glu Leu
 275 280 285
 Leu Gln Arg Leu Arg Gly Gly Ala Lys Leu Pro Leu Phe Thr Ser Cys
 290 295 300

Cys Pro Gly Trp Val Asn Phe Ala Glu Lys His Leu Pro Asp Ile Leu
 305 310 315 320
 Pro His Val Ser Thr Thr Arg Ser Pro Gln Gln Cys Leu Gly Ala Leu
 325 330 335
 Ala Lys Thr Tyr Leu Ala Arg Thr Met Asn Val Ala Pro Glu Arg Met
 340 345 350
 Arg Val Val Ser Leu Met Pro Cys Thr Ala Lys Lys Glu Glu Ala Ala
 355 360 365
 Arg Pro Glu Phe Arg Arg Asp Gly Val Arg Asp Val Asp Ala Val Leu
 370 375 380
 Thr Thr Arg Glu Phe Ala Arg Leu Leu Arg Arg Glu Gly Ile Asp Leu
 385 390 395 400
 Ala Gly Leu Glu Pro Ser Pro Cys Asp Asp Pro Leu Met Gly Arg Ala
 405 410 415
 Thr Gly Ala Ala Val Ile Phe Gly Thr Thr Gly Gly Val Met Glu Ala
 420 425 430
 Ala Leu Arg Thr Val Tyr His Val Leu Asn Gly Lys Glu Leu Ala Pro
 435 440 445
 Val Glu Leu His Ala Leu Arg Gly Tyr Glu Asn Val Arg Glu Ala Val
 450 455 460
 Val Pro Leu Gly Glu Gly Asn Gly Ser Val Lys Val Ala Val Val His
 465 470 475 480
 Gly Leu Lys Ala Ala Arg Gln Met Val Glu Ala Val Leu Ala Gly Lys
 485 490 495
 Ala Asp His Val Phe Val Glu Val Met Ala Cys Pro Gly Gly Cys Met
 500 505 510
 Asp Gly Gly Gly Gln Pro Arg Ser Lys Arg Ala Tyr Asn Pro Asn Ala
 515 520 525
 Gln Ala Arg Arg Ala Ala Leu Phe Ser Leu Asp Ala Glu Asn Ala Leu
 530 535 540
 Arg Gln Ser His Asn Asn Pro Leu Ile Gly Lys Val Tyr Glu Ser Phe
 545 550 555 560
 Leu Gly Glu Pro Cys Ser Asn Leu Ser His Arg Leu Leu His Thr Arg
 565 570 575
 Tyr Gly Asp Arg Lys Ser Glu Val Ala Tyr Thr Met Arg Asp Ile Trp
 580 585 590

His Glu Met Thr Leu Gly Arg Arg Val Arg Gly Asp Ser Asp
 595 600 605

<210> 98
 <211> 589
 <212> PRT
 <213> T. vaginalis

<400> 98

Ala Ser Thr Gly Ile Asn Ser Thr Ala Asn Ile Leu Arg Asn Ile Thr
 1 5 10 15

Val Thr Val Asn Gly Lys Pro Leu Glu Ala Lys Lys Gly Glu Thr Val
 20 25 30

Leu Glu Leu Cys Asp Arg Asn Asn Ile Arg Ile Pro Arg Leu Cys Phe
 35 40 45

His Pro Asn Leu Pro Pro Lys Ala Ser Cys Arg Val Cys Leu Val Glu
 50 55 60

Cys Asp Gly Lys Trp Leu Ser Pro Ala Cys Val Thr Thr Val Trp Asp
 65 70 75 80

Gly Leu Lys Ile Asp Thr Lys Ser Lys Asn Val Arg Asp Ser Val Glu
 85 90 95

Asn Asn Leu Lys Glu Leu Leu Asp Cys His Asp Glu Thr Cys Ser Ala
 100 105 110

Cys Ile Ala Asn His Arg Cys Gln Phe Arg Asp Met Asn Val Ala Tyr
 115 120 125

Ser Val Lys Ala Glu Thr Lys Glu Ile Cys Ser Glu Glu Gly Ile Asp
 130 135 140

Glu Ser Thr Asn Ala Ile Arg Leu Asp Thr Ser Lys Cys Val Leu Cys
 145 150 155 160

Gly Arg Cys Ile Arg Ala Cys Glu Glu Val Ala Gly Thr Ser Ala Ile
 165 170 175

Ile Phe Gly Asn Arg Ala Lys Lys Met Arg Ile Gln Pro Thr Phe Gly
 180 185 190

Val Thr Leu Gln Glu Thr Ser Cys Ile Lys Cys Gly Gln Cys Thr Leu
 195 200 205

Tyr Cys Pro Val Gly Ala Ile Thr Glu Lys Ser Gln Val Lys Glu Ala
 210 215 220

Leu Asp Ile Leu Ala Asn Lys Gly Lys Lys Ile Thr Val Val Gln Val

225 230 235 240
 Ala Pro Ala Val Arg Val Ala Leu Ser Glu Ala Phe Gly Tyr Lys Glu
 245 250 255
 Gly Thr Val Thr Thr Gly Lys Met Val Ser Ala Leu Lys Ala Leu Gly
 260 265 270
 Phe Asp Leu Val Tyr Asp Thr Asn Tyr Gly Ala Asp Leu Thr Ile Cys
 275 280 285
 Glu Glu Ala Gly Glu Leu Val Asn Arg Leu Arg Asp Pro Asn Ala Lys
 290 295 300
 Phe Pro Met Phe Thr Thr Cys Cys Pro Ala Trp Val Asn Tyr Val Glu
 305 310 315 320
 Gln Ser Ala Pro Asp Phe Ile Pro Asn Leu Ser Ser Cys Arg Ser Pro
 325 330 335
 Gln Gly Met Leu Ser Ala Leu Ile Lys Asn Tyr Leu Pro Lys Leu Leu
 340 345 350
 Asp Val Lys Gln Glu Asp Val Leu Asn Phe Ser Ile Met Pro Cys Thr
 355 360 365
 Ala Lys Lys Asp Glu Val Glu Arg Pro Glu Leu Arg Thr Lys Ser Gly
 370 375 380
 Leu Lys Glu Thr Asp Met Val Leu Thr Val Arg Glu Leu Val Glu Met
 385 390 395 400
 Ile Lys Leu Ser Asn Ile Asp Phe Asn Asn Leu Pro Asp Thr Gln Phe
 405 410 415
 Asp Asn Ile Phe Gly Phe Gly Ser Gly Ala Gly Gln Ile Phe Ala Ala
 420 425 430
 Thr Gly Gly Val Met Glu Ala Ala Ser Arg Thr Ala Phe Glu Val Tyr
 435 440 445
 Thr Gly Lys Lys Leu Thr Asn Val Asn Ile Tyr Pro Val Arg Gly Met
 450 455 460
 Asp Gly Leu Arg Ile Ala Glu Leu Asp Leu Asp Gly Thr Lys Leu Lys
 465 470 475 480
 Val Ala Val Cys His Gly Ile Ala Asn Thr Ala Lys Leu Leu Asp Arg
 485 490 495
 Leu Arg Glu Lys Asp Pro Glu Leu Met Asp Ile Lys Phe Ile Glu Ile
 500 505 510

060513 second sequence listing formatted.txt

Met Ala Cys₅₁₅ Pro Gly Gly Cys Val₅₂₀ Cys Gly Gly Gly Thr₅₂₅ Pro Gln Pro

Lys Asn₅₃₀ Arg Val Ser Leu Asp₅₃₅ Asn Arg Leu Ala Ala₅₄₀ Ile Tyr Asn Ile

Asp₅₄₅ Ala Lys Met Glu Cys₅₅₀ Arg Lys Ser His Glu₅₅₅ Asn Pro Leu Ile Lys₅₆₀

Gly Val Tyr Lys Glu₅₆₅ Phe Leu Gly Lys Pro₅₇₀ Asn Ser His Leu Ala₅₇₅ His

Glu Leu Leu His₅₈₀ Thr His Phe Lys His₅₈₅ His Pro Lys Trp

<210> 99
 <211> 1206
 <212> PRT
 <213> Nyctotherus ovalis

<400> 99

Met Ile Ser Arg Leu₅ Ile Ala Lys Lys Ala₁₀ Pro Leu Phe Leu Arg Thr₁₅

Phe Ala Thr Ser₂₀ Glu Met Ile Ser Leu₂₅ Lys Ile Asp Gly Lys₃₀ Ile Ile

Ser Val₃₅ Pro Lys Gly Ile Met Leu₄₀ Ala Asp Ala Ile Lys₄₅ Lys Ala Gly

Ala Asn Val₅₀ Pro Thr Met Cys₅₅ Tyr His Pro Asp Leu₆₀ Pro Thr Ser Gly

Gly Ile Cys Arg Val Cys₇₀ Leu Val Glu Ser Ala₇₅ Lys Ser Pro Gly Tyr₈₀

Pro Ile Ile Ser Cys₈₅ Arg Thr Pro Val Glu₉₀ Glu Gly Met Glu₉₅ Ile Val

Thr Gln Gly Ser₁₀₀ Lys Met Lys Glu Tyr₁₀₅ Arg Gln Ala Asn Leu₁₁₀ Ala Leu

Met Leu Ser₁₁₅ Arg His Pro Asn Ala₁₂₀ Cys Leu Ser Cys Thr₁₂₅ Ser Asn Thr

Asn Cys₁₃₀ Lys Thr Gln Glu Leu₁₃₅ Ser Ala Asn Met Asn₁₄₀ Ile Gly Gln Cys

Gly Phe Ala Asn Ala Thr₁₅₀ Pro Pro Lys Asn Asp₁₅₅ Asp Ser Tyr Asp Met₁₆₀

Thr Thr Ala Ile Glu₁₆₅ Arg Asp Asn Asp Lys₁₇₀ Cys Ile Asn Cys Asp₁₇₅ Ile

Cys Val His Thr Cys Ser Leu Gln Gly Leu Asn Ala Leu Gly Phe Tyr
 180 185 190
 Asn Glu Glu Gly His Ala Val Lys Ser Met Gly Thr Leu Asp Val Ser
 195 200 205
 Glu Cys Ile Gln Cys Gly Gln Cys Ile Asn Arg Cys Pro Thr Gly Ala
 210 215 220
 Ile Thr Glu Lys Ser Glu Ile Arg Pro Val Leu Asp Ala Ile Asn Ile
 225 230 235 240
 Gln Gln Arg Leu Val Phe Gln Met Ala Pro Ser Ile Arg Val Ala Val
 245 250 255
 Ala Glu Glu Phe Gly Ile Lys Pro Gly Glu Lys Ile Leu Lys Asn Glu
 260 265 270
 Ile Ala Thr Ala Leu Arg Lys Leu Gly Ser Asn Val Phe Val Leu Asp
 275 280 285
 Thr Asn Phe Ser Ala Asp Leu Thr Ile Ile Glu Glu Gly His Glu Leu
 290 295 300
 Ile Glu Arg Leu Tyr Arg Asn Val Thr Gly Lys Lys Leu Leu Gly Gly
 305 310 315 320
 Asp His Met Pro Ile Asp Leu Pro Met Leu Thr Ser Cys Cys Pro Gly
 325 330 335
 Trp Ile Met Phe Ile Glu Lys Asn Tyr Pro Asp Leu Leu Asn Asn Leu
 340 345 350
 Ser Thr Cys Lys Ser Pro Gln Gly Met Leu Gly Ala Leu Ile Lys Gly
 355 360 365
 Tyr Trp Ala Lys Asn Ile Lys Lys Met Asp Pro Lys Asp Ile Val Ser
 370 375 380
 Val Ser Ile Met Pro Cys Thr Ala Lys Lys Ala Glu Lys Glu Arg Pro
 385 390 395 400
 Gln Leu Arg Gly Asp Glu Gly Tyr Lys Asp Val Asp Tyr Ile Leu Thr
 405 410 415
 Thr Arg Glu Leu Ala Lys Met Leu Lys Gln Ser Asn Ile Asp Leu Ala
 420 425 430
 Lys Met Glu Pro Thr Pro Phe Asp Lys Val Met Ser Glu Gly Thr Gly
 435 440 445

Ala Ala Val Ile Phe Gly Val Thr Gly Gly Val Met Glu Ala Ala Leu
 450 455 460

Arg Thr Ala Asn Glu Val Ile Thr Gly Arg Glu Val Pro Phe Lys Asn
 465 470 475 480

Leu Asn Ile Glu Ala Val Arg Gly Met Glu Gly Ile Arg Glu Ala Gly
 485 490 495

Ile Lys Leu Glu Asn Val Leu Asp Lys Tyr Lys Ala Phe Glu Gly Val
 500 505 510

Thr Val Lys Val Ala Ile Ala His Gly Pro Asn Asn Ala Arg Lys Val
 515 520 525

Met Asp Ile Ile Lys Gln Ala Lys Glu Ser Gly Lys Pro Ala Pro Trp
 530 535 540

His Phe Val Glu Val Met Ala Cys Pro Gly Gly Cys Ile Gly Gly Gly
 545 550 555 560

Gly Gln Pro Lys Pro Thr Asn Leu Glu Ile Arg Gln Ala Arg Thr Gln
 565 570 575

Leu Thr Phe Lys Glu Asp Met Asp Leu Pro Leu Arg Lys Ser His Asp
 580 585 590

Asn Pro Glu Ile Lys Ala Ile Tyr Glu Asn Tyr Leu Lys Glu Pro Leu
 595 600 605

Gly His Asn Ser His His Tyr Leu His Thr Thr Tyr Ser Ser Gln Lys
 610 615 620

Val Arg Asp Met Asn Leu Tyr Asn Ala Asn Glu Ala Ala Gly Leu Asp
 625 630 635 640

Glu Ile Leu Ala Lys Tyr Pro Lys Glu Lys Glu Tyr Leu Met Pro Ile
 645 650 655

Ile Ile Glu Glu His Asp Lys Lys Gly Tyr Ile Ser Asp Pro Ser Ile
 660 665 670

Val Lys Ile Ser Glu His Leu Gly Met Tyr Pro Ala Gln Ile Glu Ser
 675 680 685

Ile Leu Ser Ser Tyr His Tyr Phe Pro Arg Glu His Thr Ile Ala Ile
 690 695 700

Leu Met Ser Ile Cys Val His Cys His Asn Cys Met Met Lys Gly Gln
 705 710 715 720

Gly Arg Leu Leu Lys Thr Ile Gln Glu Thr Tyr Asp Ile His Glu Thr
 725 730 735

His Gly Gly Val Ala Lys Asp Gly Ser Phe Thr Leu His Thr Leu Asn
 740 745 750
 Trp Leu Gly Tyr Cys Val Asn Asp Ala Pro Ala Met Met Ile Lys Arg
 755 760 765
 Lys Gly Thr Asn Tyr Val Glu Thr Phe Thr Gly Leu Leu Gly Asp Asn
 770 775 780
 Ile Asp Gln Arg Leu Lys Ser Leu Lys Asn Leu Lys Lys Glu Leu Pro
 785 790 795 800
 Lys Trp Pro Lys Asn Asn Ile Arg Glu Met Lys Ser Gln Arg Asn Gly
 805 810 815
 Asn Ser Tyr Ser Cys Met Asn Thr Gln Ala Pro Ile Ala Glu Ala Thr
 820 825 830
 Lys Lys Ala Val Ser Met Gly Pro Glu Lys Val Ile Glu Glu Val Phe
 835 840 845
 Lys Ser Asn Leu Val Gly Arg Gly Gly Ala Gly Phe Arg Thr Gly Lys
 850 855 860
 Lys Trp Glu Ser Ala Tyr Lys Thr Pro Ala Ser Asp Lys Tyr Val Val
 865 870 875 880
 Cys Asn Ala Asp Glu Gly Leu Pro Ser Thr Tyr Lys Asp Trp Cys Leu
 885 890 895
 Leu Asn Asn Glu Ala Lys Arg Lys Glu Val Phe Thr Gly Met Gly Ile
 900 905 910
 Cys Ala Lys Thr Ile Gly Ala Lys Arg Cys Phe Met Tyr Leu Arg Tyr
 915 920 925
 Glu Tyr Arg Asn Leu Val Pro Ala Leu Glu Gln Ser Ile Lys Asp Val
 930 935 940
 Gln Ser Thr Cys Pro Glu Leu Ala Asp Leu Lys Tyr Glu Ile Arg Leu
 945 950 955 960
 Gly Gly Gly Pro Tyr Val Ala Gly Glu Glu Asn Ala Gln Phe Glu Ser
 965 970 975
 Ile Glu Gly Arg Ala Pro Leu Pro Arg Lys Asp Arg Pro Gly Asn Ile
 980 985 990
 Phe Pro Thr Met Glu Gly Leu Phe His Lys Pro Thr Val Ile Asn Asn
 995 1000 1005

Val Glu Thr Phe Phe Ala Ile Pro His Ile Ile Gln Gln Gly Ser
 1010 1015 1020
 Gln Ser Phe Gly Glu Gly Lys Met Pro Lys Leu Leu Ser Val Thr
 1025 1030 1035
 Gly Asp Val Asp Glu Pro Ile Leu Ile Glu Thr Asn Leu Asn Asn
 1040 1045 1050
 Tyr Ser Leu Asn His Leu Leu Gln Glu Ile Ser Ala Lys Asp Ile
 1055 1060 1065
 Val Ala Ala Glu Ile Gly Gly Cys Thr Glu Pro Ile Ile Phe Gly
 1070 1075 1080
 Ser Lys Phe Asp Thr Leu Phe Gly Phe Gly Arg Gly Thr Leu Asn
 1085 1090 1095
 Ala Val Gly Ser Val Val Leu Phe Asn Ser Ser Cys Asp Leu Gly
 1100 1105 1110
 Lys Ile Tyr Glu Asn Lys Leu Lys Phe Met Ala Glu Glu Ser Cys
 1115 1120 1125
 Lys Gln Cys Val Pro Cys Arg Asp Gly Ser Tyr Ile Phe His Arg
 1130 1135 1140
 Ala Phe Lys Glu Leu Arg Asp Thr Gly Lys Ser Ser Tyr Asn Met
 1145 1150 1155
 Arg Ala Leu Ala Val Ala Ser Glu Ser Ala Ala Arg Ser Ser Ile
 1160 1165 1170
 Cys Ala His Gly Lys Ala Leu Glu Ser Leu Phe Lys Ser Ala Cys
 1175 1180 1185
 Asp Phe Met Asn Lys Thr Lys Pro Ile Tyr Gln Pro His Ser Thr
 1190 1195 1200
 Tyr His Gln
 1205

<210> 100
 <211> 468
 <212> PRT
 <213> T vaginalis

<400> 100

Met Leu Ala Ser Ser Ala Thr Ala Met Lys Gly Phe Ala Asn Ser Leu
 1 5 10 15

Arg Met Lys Asp Tyr Ser Ser Thr Gly Ile Asn Phe Asp Met Thr Lys
 20 25 30

060513 second sequence listing formatted.txt

Cys Ile Asn Cys Gln Ser Cys Val Arg Ala Cys Thr Asn Ile Ala Gly
 35 40 45
 Gln Asn Val Leu Lys Ser Leu Thr Val Asn Gly Lys Ser Val Val Gln
 50 55 60
 Thr Val Thr Gly Lys Pro Leu Ala Glu Thr Asn Cys Ile Ser Cys Gly
 65 70 75 80
 Gln Cys Thr Leu Gly Cys Pro Lys Phe Thr Ile Phe Glu Ala Asp Ala
 85 90 95
 Ile Asn Pro Val Lys Glu Val Leu Thr Lys Lys Asn Gly Arg Ile Ala
 100 105 110
 Val Cys Gln Ile Ala Pro Ala Ile Arg Ile Asn Met Ala Glu Ala Leu
 115 120 125
 Gly Val Pro Ala Gly Thr Ile Ser Leu Gly Lys Val Val Thr Ala Leu
 130 135 140
 Lys Arg Leu Gly Phe Asp Tyr Val Phe Asp Thr Asn Phe Ala Ala Asp
 145 150 155 160
 Met Thr Ile Val Glu Glu Ala Thr Glu Leu Val Gln Arg Leu Ser Asp
 165 170 175
 Lys Asn Ala Val Leu Pro Met Phe Thr Ser Cys Cys Pro Ala Trp Val
 180 185 190
 Asn Tyr Val Glu Lys Ser Asp Pro Ser Leu Ile Pro Tyr Leu Ser Ser
 195 200 205
 Cys Arg Ser Pro Met Ser Met Leu Ser Ser Val Ile Lys Asn Val Phe
 210 215 220
 Pro Lys Lys Ile Gly Thr Thr Ala Asp Lys Ile Tyr Asn Val Ala Ile
 225 230 235 240
 Met Pro Cys Thr Arg Lys Lys Asp Glu Ile Gln Arg Ser Gln Phe Thr
 245 250 255
 Met Lys Asp Gly Lys Gln Glu Thr Gly Ala Val Leu Thr Ser Arg Glu
 260 265 270
 Leu Ala Lys Met Ile Lys Glu Ala Lys Ile Asn Phe Lys Glu Leu Pro
 275 280 285
 Asp Thr Pro Cys Asp Asn Phe Tyr Ser Glu Ala Ser Gly Gly Gly Ala
 290 295 300
 Ile Phe Cys Ala Thr Gly Gly Val Met Glu Ala Ala Val Arg Ser Ala

305 310 315 320
 Tyr Lys Phe Leu Thr Lys Lys Glu Leu Ala Pro Ile Asp Leu Gln Asp
 325 330 335
 Val Arg Gly Val Ala Ser Gly Val Lys Leu Ala Glu Val Asp Ile Ala
 340 345 350
 Gly Thr Lys Val Lys Val Ala Val Ala His Gly Ile Lys Asn Ala Met
 355 360 365
 Thr Leu Ile Lys Lys Ile Lys Ser Gly Glu Glu Gln Phe Lys Asp Val
 370 375 380
 Lys Phe Val Glu Val Met Ala Cys Pro Gly Gly Cys Val Val Gly Gly
 385 390 395 400
 Gly Ser Pro Lys Ala Lys Thr Lys Lys Ala Val Gln Ala Arg Leu Asn
 405 410 415
 Ala Thr Tyr Ser Ile Asp Lys Ser Ser Lys His Arg Thr Ser Gln Asp
 420 425 430
 Asn Pro Gln Leu Leu Gln Leu Tyr Lys Glu Ser Phe Glu Gly Lys Phe
 435 440 445
 Gly Gly His Val Ala His His Leu Leu His Thr His Tyr Lys Asn Arg
 450 455 460
 Lys Val Asn Pro
 465
 <210> 101
 <211> 582
 <212> PRT
 <213> C. acetobutylicum
 <400> 101
 Met Lys Thr Ile Ile Leu Asn Gly Asn Glu Val His Thr Asp Lys Asp
 1 5 10 15
 Ile Thr Ile Leu Glu Leu Ala Arg Glu Asn Asn Val Asp Ile Pro Thr
 20 25 30
 Leu Cys Phe Leu Lys Asp Cys Gly Asn Phe Gly Lys Cys Gly Val Cys
 35 40 45
 Met Val Glu Val Glu Gly Lys Gly Phe Arg Ala Ala Cys Val Ala Lys
 50 55 60
 Val Glu Asp Gly Met Val Ile Asn Thr Glu Ser Asp Glu Val Lys Glu
 65 70 75 80

Arg Ile Lys Lys Arg Val Ser Met Leu Leu Asp Lys His Glu Phe Lys
 85 90 95
 Cys Gly Gln Cys Ser Arg Arg Glu Asn Cys Glu Phe Leu Lys Leu Val
 100 105 110
 Ile Lys Thr Lys Ala Lys Ala Ser Lys Pro Phe Leu Pro Glu Asp Lys
 115 120 125
 Asp Ala Leu Val Asp Asn Arg Ser Lys Ala Ile Val Ile Asp Arg Ser
 130 135 140
 Lys Cys Val Leu Cys Gly Arg Cys Val Ala Ala Cys Lys Gln His Thr
 145 150 155 160
 Ser Thr Cys Ser Ile Gln Phe Ile Lys Lys Asp Gly Gln Arg Ala Val
 165 170 175
 Gly Thr Val Asp Asp Val Cys Leu Asp Asp Ser Thr Cys Leu Leu Cys
 180 185 190
 Gly Gln Cys Val Ile Ala Cys Pro Val Ala Ala Leu Lys Glu Lys Ser
 195 200 205
 His Ile Glu Lys Val Gln Glu Ala Leu Asn Asp Pro Lys Lys His Val
 210 215 220
 Ile Val Ala Met Ala Pro Ser Val Arg Thr Ala Met Gly Glu Leu Phe
 225 230 235 240
 Lys Met Gly Tyr Gly Lys Asp Val Thr Gly Lys Leu Tyr Thr Ala Leu
 245 250 255
 Arg Met Leu Gly Phe Asp Lys Val Phe Asp Ile Asn Phe Gly Ala Asp
 260 265 270
 Met Thr Ile Met Glu Glu Ala Thr Glu Leu Leu Gly Arg Val Lys Asn
 275 280 285
 Asn Gly Pro Phe Pro Met Phe Thr Ser Cys Cys Pro Ala Trp Val Arg
 290 295 300
 Leu Ala Gln Asn Tyr His Pro Glu Leu Leu Asp Asn Leu Ser Ser Ala
 305 310 315 320
 Lys Ser Pro Gln Gln Ile Phe Gly Thr Ala Ser Lys Thr Tyr Tyr Pro
 325 330 335
 Ser Ile Ser Gly Ile Ala Pro Glu Asp Val Tyr Thr Val Thr Ile Met
 340 345 350
 Pro Cys Asn Asp Lys Lys Tyr Glu Ala Asp Ile Pro Phe Met Glu Thr
 355 360 365

060513 second sequence listing formatted.txt

Asn Ser Leu Arg Asp Ile Asp Ala Ser Leu Thr Thr Arg Glu Leu Ala
370 375 380

Lys Met Ile Lys Asp Ala Lys Ile Lys Phe Ala Asp Leu Glu Asp Gly
385 390 395 400

Glu Val Asp Pro Ala Met Gly Thr Tyr Ser Gly Ala Gly Ala Ile Phe
405 410 415

Gly Ala Thr Gly Gly Val Met Glu Ala Ala Ile Arg Ser Ala Lys Asp
420 425 430

Phe Ala Glu Asn Lys Glu Leu Glu Asn Val Asp Tyr Thr Glu Val Arg
435 440 445

Gly Phe Lys Gly Ile Lys Glu Ala Glu Val Glu Ile Ala Gly Asn Lys
450 455 460

Leu Asn Val Ala Val Ile Asn Gly Ala Ser Asn Phe Phe Glu Phe Met
465 470 475 480

Lys Ser Gly Lys Met Asn Glu Lys Gln Tyr His Phe Ile Glu Val Met
485 490 495

Ala Cys Pro Gly Gly Cys Ile Asn Gly Gly Gly Gln Pro His Val Asn
500 505 510

Ala Leu Asp Arg Glu Asn Val Asp Tyr Arg Lys Leu Arg Ala Ser Val
515 520 525

Leu Tyr Asn Gln Asp Lys Asn Val Leu Ser Lys Arg Lys Ser His Asp
530 535 540

Asn Pro Ala Ile Ile Lys Met Tyr Asp Ser Tyr Phe Gly Lys Pro Gly
545 550 555 560

Glu Gly Leu Ala His Lys Leu Leu His Val Lys Tyr Thr Lys Asp Lys
565 570 575

Asn Val Ser Lys His Glu
580

<210> 102
<211> 574
<212> PRT
<213> Clostridium pasteurianum

<400> 102

Met Lys Thr Ile Ile Ile Asn Gly Val Gln Phe Asn Thr Asp Glu Asp
1 5 10 15

Thr Thr Ile Leu Lys Phe Ala Arg Asp Asn Asn Ile Asp Ile Ser Ala

20

25

30

Leu Cys Phe Leu Asn Asn Cys Asn Asn Asp Ile Asn Lys Cys Glu Ile
 35 40 45

Cys Thr Val Glu Val Glu Gly Thr Gly Leu Val Thr Ala Cys Asp Thr
 50 55 60

Leu Ile Glu Asp Gly Met Ile Ile Asn Thr Asn Ser Asp Ala Val Asn
 65 70 75 80

Glu Lys Ile Lys Ser Arg Ile Ser Gln Leu Leu Asp Ile His Glu Phe
 85 90 95

Lys Cys Gly Pro Cys Asn Arg Arg Glu Asn Cys Glu Phe Leu Lys Leu
 100 105 110

Val Ile Lys Tyr Lys Ala Arg Ala Ser Lys Pro Phe Leu Pro Lys Asp
 115 120 125

Lys Thr Glu Tyr Val Asp Glu Arg Ser Lys Ser Leu Thr Val Asp Arg
 130 135 140

Thr Lys Cys Leu Leu Cys Gly Arg Cys Val Asn Ala Cys Gly Lys Asn
 145 150 155 160

Thr Glu Thr Tyr Ala Met Lys Phe Leu Asn Lys Asn Gly Lys Thr Ile
 165 170 175

Ile Gly Ala Glu Asp Glu Lys Cys Phe Asp Asp Thr Asn Cys Leu Leu
 180 185 190

Cys Gly Gln Cys Ile Ile Ala Cys Pro Val Ala Ala Leu Ser Glu Lys
 195 200 205

Ser His Met Asp Arg Val Lys Asn Ala Leu Asn Ala Pro Glu Lys His
 210 215 220

Val Ile Val Ala Met Ala Pro Ser Val Arg Ala Ser Ile Gly Glu Leu
 225 230 235 240

Phe Asn Met Gly Phe Gly Val Asp Val Thr Gly Lys Ile Tyr Thr Ala
 245 250 255

Leu Arg Gln Leu Gly Phe Asp Lys Ile Phe Asp Ile Asn Phe Gly Ala
 260 265 270

Asp Met Thr Ile Met Glu Glu Ala Thr Glu Leu Val Gln Arg Ile Glu
 275 280 285

Asn Asn Gly Pro Phe Pro Met Phe Thr Ser Cys Cys Pro Gly Trp Val
 290 295 300

060513 second sequence listing formatted.txt

Arg Gln Ala Glu Asn Tyr Tyr Pro Glu Leu Leu Asn Asn Leu Ser Ser
305 310 315 320

Ala Lys Ser Pro Gln Gln Ile Phe Gly Thr Ala Ser Lys Thr Tyr Tyr
325 330 335

Pro Ser Ile Ser Gly Leu Asp Pro Lys Asn Val Phe Thr Val Thr Val
340 345 350

Met Pro Cys Thr Ser Lys Lys Phe Glu Ala Asp Arg Pro Gln Met Glu
355 360 365

Lys Asp Gly Leu Arg Asp Ile Asp Ala Val Ile Thr Thr Arg Glu Leu
370 375 380

Ala Lys Met Ile Lys Asp Ala Lys Ile Pro Phe Ala Lys Leu Glu Asp
385 390 395 400

Ser Glu Ala Asp Pro Ala Met Gly Glu Tyr Ser Gly Ala Gly Ala Ile
405 410 415

Phe Gly Ala Thr Gly Gly Val Met Glu Ala Ala Leu Arg Ser Ala Lys
420 425 430

Asp Phe Ala Glu Asn Ala Glu Leu Glu Asp Ile Glu Tyr Lys Gln Val
435 440 445

Arg Gly Leu Asn Gly Ile Lys Glu Ala Glu Val Glu Ile Asn Asn Asn
450 455 460

Lys Tyr Asn Val Ala Val Ile Asn Gly Ala Ser Asn Leu Phe Lys Phe
465 470 475 480

Met Lys Ser Gly Met Ile Asn Glu Lys Gln Tyr His Phe Ile Glu Val
485 490 495

Met Ala Cys His Gly Gly Cys Val Asn Gly Gly Gly Gln Pro His Val
500 505 510

Asn Pro Lys Asp Leu Glu Lys Val Asp Ile Lys Lys Val Arg Ala Ser
515 520 525

Val Leu Tyr Asn Gln Asp Glu His Leu Ser Lys Arg Lys Ser His Glu
530 535 540

Asn Thr Ala Leu Val Lys Met Tyr Gln Asn Tyr Phe Gly Lys Pro Gly
545 550 555 560

Glu Gly Arg Ala His Glu Ile Leu His Phe Lys Tyr Lys Lys
565 570

<211> 421

<212> PRT

<213> Desulfovibrio vulgaris

<400> 103

Met Ser Arg Thr Val Met Glu Arg Ile Glu Tyr Glu Met His Thr Pro
 1 5 10 15

Asp Pro Lys Ala Asp Pro Asp Lys Leu His Phe Val Gln Ile Asp Glu
 20 25 30

Ala Lys Cys Ile Gly Cys Asp Thr Cys Ser Gln Tyr Cys Pro Thr Ala
 35 40 45

Ala Ile Phe Gly Glu Met Gly Glu Pro His Ser Ile Pro His Ile Glu
 50 55 60

Ala Cys Ile Asn Cys Gly Gln Cys Leu Thr His Cys Pro Glu Asn Ala
 65 70 75 80

Ile Tyr Glu Ala Gln Ser Trp Val Pro Glu Val Glu Lys Lys Leu Lys
 85 90 95

Asp Gly Lys Val Lys Cys Ile Ala Met Pro Ala Pro Ala Val Arg Tyr
 100 105 110

Ala Leu Gly Asp Ala Phe Gly Met Pro Val Gly Ser Val Thr Thr Gly
 115 120 125

Lys Met Leu Ala Ala Leu Gln Lys Leu Gly Phe Ala His Cys Trp Asp
 130 135 140

Thr Glu Phe Thr Ala Asp Val Thr Ile Trp Glu Glu Gly Ser Glu Phe
 145 150 155 160

Val Glu Arg Leu Thr Lys Lys Ser Asp Met Pro Leu Pro Gln Phe Thr
 165 170 175

Ser Cys Cys Pro Gly Trp Gln Lys Tyr Ala Glu Thr Tyr Tyr Pro Glu
 180 185 190

Leu Leu Pro His Phe Ser Thr Cys Lys Ser Pro Ile Gly Met Asn Gly
 195 200 205

Ala Leu Ala Lys Thr Tyr Gly Ala Glu Arg Met Lys Tyr Asp Pro Lys
 210 215 220

Gln Val Tyr Thr Val Ser Ile Met Pro Cys Ile Ala Lys Lys Tyr Glu
 225 230 235 240

Gly Leu Arg Pro Glu Leu Lys Ser Ser Gly Met Arg Asp Ile Asp Ala
 245 250 255

Thr Leu Thr Thr Arg Glu Leu Ala Tyr Met Ile Lys Lys Ala Gly Ile
 260 265 270

Asp Phe Ala Lys Leu Pro Asp Gly Lys Arg Asp Ser Leu Met Gly Glu
 275 280 285

Ser Thr Gly Gly Ala Thr Ile Phe Gly Val Thr Gly Gly Val Met Glu
 290 295 300

Ala Ala Leu Arg Phe Ala Tyr Glu Ala Val Thr Gly Lys Lys Pro Asp
 305 310 315 320

Ser Trp Asp Phe Lys Ala Val Arg Gly Leu Asp Gly Ile Lys Glu Ala
 325 330 335

Thr Val Asn Val Gly Gly Thr Asp Val Lys Val Ala Val Val His Gly
 340 345 350

Ala Lys Arg Phe Lys Gln Val Cys Asp Asp Val Lys Ala Gly Lys Ser
 355 360 365

Pro Tyr His Phe Ile Glu Tyr Met Ala Cys Pro Gly Gly Cys Val Cys
 370 375 380

Gly Gly Gly Gln Pro Val Met Pro Gly Val Leu Glu Ala Met Asp Arg
 385 390 395 400

Thr Thr Thr Arg Leu Tyr Ala Gly Leu Lys Lys Arg Leu Ala Met Ala
 405 410 415

Ser Ala Asn Lys Ala
 420

<210> 104
 <211> 449
 <212> PRT
 <213> Trichomonas vaginalis

<400> 104

Met Leu Ala Ser Ser Ser Arg Ala Ala Ala Asn Ile Arg Trp Val Asp
 1 5 10 15

Thr Ser His Asn Ala Ile Ala Phe Asp Met His Lys Cys Ile Asn Cys
 20 25 30

Gln Ala Cys Val Arg Ala Cys Lys Asn Val Ala Gly Gln Ser Val Leu
 35 40 45

Lys Ser Val Lys Ile Asn Glu Gly Lys Lys Lys Gly Val Val Gln Thr
 50 55 60

Val Thr Gly Lys Leu Leu Ala Glu Thr Asn Cys Ile Gly Cys Gly Gln
 65 70 75 80

060513 second sequence listing formatted.txt

Cys Thr Leu Val Cys₈₅ Pro Thr Gln Ala Ile₉₀ His Glu Lys Asp Ala₉₅ Leu
 Lys Gln Met Asn₁₀₀ Asn Ile Phe Lys Asn₁₀₅ Lys Gly Asp Arg Ile₁₁₀ Leu Val
 Cys Gln Ile₁₁₅ Ala Pro Ala Ile Arg₁₂₀ Ile Asn Met Arg Arg₁₂₅ Pro Trp Cys
 Ser Ser₁₃₀ Arg Asn Ser Phe His₁₃₅ Arg Gln Ser Arg Tyr₁₄₀ Ser Pro Gln Arg
 Leu Gly Phe Asp Tyr Val₁₅₀ Phe Asp Thr Asn Phe₁₅₅ Gly Ala Asp Leu Thr₁₆₀
 Ile Val Glu Glu Ala₁₆₅ Thr Glu Leu Leu Gln₁₇₀ Arg Leu Asn Asp Pro₁₇₅ Lys
 Ala Val Leu Pro₁₈₀ Met Phe Thr Ser Cys₁₈₅ Cys Pro Ala Trp Val₁₉₀ Asn Tyr
 Val Glu Lys₁₉₅ Ser Tyr Pro Gln Trp₂₀₀ Met Pro His Leu Ser₂₀₅ Thr Cys Arg
 Ser Pro₂₁₀ Ile Gly Met Leu Ser₂₁₅ Ala Val Ile Lys Asn₂₂₀ Val Phe Pro Lys
 His Ile Gly Val Asp Pro₂₃₀ Lys Arg Ile Phe Ser₂₃₅ Val Gly Ile Met Pro₂₄₀
 Cys Thr Ala Lys Lys₂₄₅ Asp Glu Ala Ala Arg₂₅₀ Glu Gln Leu Met Thr₂₅₅ Lys
 Ser Gly Leu His₂₆₀ Glu Thr Asp Leu Asp₂₆₅ Ile Thr Ser Arg Glu₂₇₀ Leu Ala
 Lys Met Ile₂₇₅ Lys Ala Ala Lys Ile₂₈₀ Asn Phe Lys Glu Leu₂₈₅ Pro Asp Thr
 Glu Leu Asp Ser Pro Tyr Ala₂₉₅ Met Ala Thr Gly Gly₃₀₀ Gly Ala Ile Phe
 Cys Ala Thr Gly Gly Val₃₁₀ Met Glu Ala Ala Val₃₁₅ Arg Ser Ala Tyr Lys₃₂₀
 Phe Ala Thr Gly Lys₃₂₅ Glu Leu Ala Pro Ile₃₃₀ Glu Phe Val Gln Val₃₃₅ Arg
 Gly Ala Glu Lys₃₄₀ Gly Ile Lys Val Gly₃₄₅ Thr Val Asp Ile Asn₃₅₀ Gly Arg
 Glu Ile Lys Val Ala Val Ala Gln Gly Val Lys Asn Ala Met Ser Leu

355

360

365

Ile Lys Lys Ile Glu Glu Gly Gln Asp Asp Val Lys Gly Val Val Phe
 370 375 380

Cys Glu Val Met Ala Cys Pro Gly Gly Cys Val Gly Gly Gly Gly Ser
 385 390 395 400

Pro Arg Ala Lys Thr Lys Ala Ala Met Asn Lys Arg Leu Asp Ala Thr
 405 410 415

Tyr Arg Ile Asp Arg Ala Ser Lys Tyr Arg Thr Pro Gln Asp Asn Thr
 420 425 430

Gln Leu Gln Asp Leu Tyr Asn Ala Thr Trp Val Val Ser Leu Val Met
 435 440 445

Asp

<210> 105
 <211> 645
 <212> PRT
 <213> T. maritima

<400> 105

Met Lys Ile Tyr Val Asp Gly Arg Glu Val Ile Ile Asn Asp Asn Glu
 1 5 10 15

Arg Asn Leu Leu Glu Ala Leu Lys Asn Val Gly Ile Glu Ile Pro Asn
 20 25 30

Leu Cys Tyr Leu Ser Glu Ala Ser Ile Tyr Gly Ala Cys Arg Met Cys
 35 40 45

Leu Val Glu Ile Asn Gly Gln Ile Thr Thr Ser Cys Thr Leu Lys Pro
 50 55 60

Tyr Glu Gly Met Lys Val Lys Thr Asn Thr Pro Glu Ile Tyr Glu Met
 65 70 75 80

Arg Arg Asn Ile Leu Glu Leu Ile Leu Ala Thr His Asn Arg Asp Cys
 85 90 95

Thr Thr Cys Asp Arg Asn Gly Ser Cys Lys Leu Gln Lys Tyr Ala Glu
 100 105 110

Asp Phe Gly Ile Arg Lys Ile Arg Phe Glu Ala Leu Lys Lys Glu His
 115 120 125

Val Arg Asp Glu Ser Ala Pro Val Val Arg Asp Thr Ser Lys Cys Ile
 130 135 140

Leu Cys Gly Asp Cys Val Arg Val Cys Glu Glu Ile Gln Gly Val Gly
 145 150 155 160
 Val Ile Glu Phe Ala Lys Arg Gly Phe Glu Ser Val Val Thr Thr Ala
 165 170 175
 Phe Asp Thr Pro Leu Ile Glu Thr Glu Cys Val Leu Cys Gly Gln Cys
 180 185 190
 Val Ala Tyr Cys Pro Thr Gly Ala Leu Ser Ile Arg Asn Asp Ile Asp
 195 200 205
 Lys Leu Ile Glu Ala Leu Glu Ser Asp Lys Ile Val Ile Gly Met Ile
 210 215 220
 Ala Pro Ala Val Arg Ala Ala Ile Gln Glu Glu Phe Gly Ile Asp Glu
 225 230 235 240
 Asp Val Ala Met Ala Glu Lys Leu Val Ser Phe Leu Lys Thr Ile Gly
 245 250 255
 Phe Asp Lys Val Phe Asp Val Ser Phe Gly Ala Asp Leu Val Ala Tyr
 260 265 270
 Glu Glu Ala His Glu Phe Tyr Glu Arg Leu Lys Lys Gly Glu Arg Leu
 275 280 285
 Pro Gln Phe Thr Ser Cys Cys Pro Ala Trp Val Lys His Ala Glu His
 290 295 300
 Thr Tyr Pro Gln Tyr Leu Gln Asn Leu Ser Ser Val Lys Ser Pro Gln
 305 310 315 320
 Gln Ala Leu Gly Thr Val Ile Lys Lys Ile Tyr Ala Arg Lys Leu Gly
 325 330 335
 Val Pro Glu Glu Lys Ile Phe Leu Val Ser Phe Met Pro Cys Thr Ala
 340 345 350
 Lys Lys Phe Glu Ala Glu Arg Glu Glu His Glu Gly Ile Val Asp Ile
 355 360 365
 Val Leu Thr Thr Arg Glu Leu Ala Gln Leu Ile Lys Met Ser Arg Ile
 370 375 380
 Asp Ile Asn Arg Val Glu Pro Gln Pro Phe Asp Arg Pro Tyr Gly Val
 385 390 395 400
 Ser Ser Gln Ala Gly Leu Gly Phe Gly Lys Ala Gly Gly Val Phe Ser
 405 410 415
 Cys Val Leu Ser Val Leu Asn Glu Glu Ile Gly Ile Glu Lys Val Asp
 420 425 430

060513 second sequence listing formatted.txt

Val Lys Ser Pro Glu Asp Gly Ile Arg Val Ala Glu Val Thr Leu Lys
435 440 445

Asp Gly Thr Ser Phe Lys Gly Ala Val Ile Tyr Gly Leu Gly Lys Val
450 455 460

Lys Lys Phe Leu Glu Glu Arg Lys Asp Val Glu Ile Ile Glu Val Met
465 470 475 480

Ala Cys Asn Tyr Gly Cys Val Gly Gly Gly Gln Pro Tyr Pro Asn
485 490 495

Asp Ser Arg Ile Arg Glu His Arg Ala Lys Val Leu Arg Asp Thr Met
500 505 510

Gly Ile Lys Ser Leu Leu Thr Pro Val Glu Asn Leu Phe Leu Met Lys
515 520 525

Leu Tyr Glu Glu Asp Leu Lys Asp Glu His Thr Arg His Glu Ile Leu
530 535 540

His Thr Thr Tyr Arg Pro Arg Arg Arg Tyr Pro Glu Lys Asp Val Glu
545 550 555 560

Ile Leu Pro Val Pro Asn Gly Glu Lys Arg Thr Val Lys Val Cys Leu
565 570 575

Gly Thr Ser Cys Tyr Thr Lys Gly Ser Tyr Glu Ile Leu Lys Lys Leu
580 585 590

Val Asp Tyr Val Lys Glu Asn Asp Met Glu Gly Lys Ile Glu Val Leu
595 600 605

Gly Thr Phe Cys Val Glu Asn Cys Gly Ala Ser Pro Asn Val Ile Val
610 615 620

Asp Asp Lys Ile Ile Gly Gly Ala Thr Phe Glu Lys Val Leu Glu Glu
625 630 635 640

Leu Ser Lys Asn Gly
645

<210> 106
<211> 369
<212> PRT
<213> T vaginalis

<400> 106

Cys Asp Gly Lys Trp Leu Ala Pro Ala Cys Val Thr Thr Val Trp Asp
1 5 10 15

Gly Leu Lys Ile Asp Thr Lys Ser Lys Met Val Lys Glu Ser Val Glu
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20

25

30

Asn Asn Leu Lys Glu Leu Leu Asp Cys His Asp Glu Thr Cys Ser Ser
 35 40 45

Cys Val Ala Asn His Arg Cys Gln Phe Arg Asp Met Asn Val Ala Tyr
 50 55 60

Ser Ile Lys Ala Glu Thr Lys Glu Glu Cys Ser Glu Glu Gly Ile Asp
 65 70 75 80

Glu Ser Thr Asn Ser Ile Arg Leu Asp Thr Ser Lys Cys Val Leu Cys
 85 90 95

Gly Arg Cys Ile Arg Ala Cys Glu Glu Val Ala Gly Gln Ser Ala Ile
 100 105 110

Ile Phe Gly Asn Arg Ala Lys His Met Arg Ile Gln Pro Thr Phe Gly
 115 120 125

Gln Thr Leu Gln Asp Thr Ser Cys Ile Lys Cys Gly Gln Cys Thr Leu
 130 135 140

Tyr Cys Pro Val Gly Ala Ile Thr Glu Lys Ser Gln Val Lys Gln Ala
 145 150 155 160

Leu Asp Ile Leu Ser Asn Lys Gly Lys Lys Ile Ser Val Ile Gln Val
 165 170 175

Ala Pro Ala Val Arg Val Ala Leu Ser Glu Ala Phe Gly Tyr Lys Glu
 180 185 190

Gly Ser Val Thr Thr Gly Lys Met Val Ser Ala Leu Lys Ala Leu Gly
 195 200 205

Phe Asp Tyr Val Tyr Asp Thr Asn Tyr Ser Ala Asp Leu Thr Ile Val
 210 215 220

Glu Glu Ala Gly Glu Leu Val Gln Arg Leu Lys Asn Pro Asn Ala Val
 225 230 235 240

Phe Pro Met Phe Thr Ser Cys Cys Pro Ala Trp Val Asn Tyr Val Glu
 245 250 255

Gln Ser Ala Pro Asp Phe Ile Pro Asn Leu Ser Ser Cys Arg Ser Pro
 260 265 270

Gln Gly Met Leu Ser Ser Leu Val Lys Asn Tyr Leu Pro Lys Val Leu
 275 280 285

Asn Ile Pro Val Glu Asp Val Leu Asn Phe Ser Ile Met Pro Cys Thr
 290 295 300

060513 second sequence listing formatted.txt

Ala Lys Lys Asp Glu Ile Glu Arg Pro Glu Leu Arg Thr Lys Asp Gly
305 310 315 320

His Lys Glu Thr Asp Met Val Leu Thr Val Arg Glu Leu Val Glu Met
325 330 335

Ile Lys Leu Ser Gly Ile Asp Phe Asn Asn Leu Pro Asp Thr Pro Phe
340 345 350

Asp Ser Ile Phe Gly Phe Gly Ser Gly Ala Gly Gln Ile Phe Ala Ala
355 360 365

Thr

<210> 107
<211> 476
<212> PRT
<213> R. norvegicus

<400> 107

Met Ala Ser Pro Phe Ser Gly Ala Leu Gln Leu Thr Asp Leu Asp Asp
1 5 10 15

Phe Ile Gly Pro Ser Gln Ser Cys Ile Lys Pro Val Thr Val Ala Lys
20 25 30

Lys Pro Gly Ser Gly Ile Ala Lys Ile His Ile Glu Asp Asp Gly Ser
35 40 45

Tyr Phe Gln Val Asn Pro Asp Gly Arg Ser Gln Lys Leu Glu Lys Ala
50 55 60

Lys Val Ser Leu Asn Asp Cys Leu Ala Cys Ser Gly Cys Val Thr Ser
65 70 75 80

Ala Glu Thr Ile Leu Ile Thr Gln Gln Ser His Glu Glu Leu Arg Lys
85 90 95

Val Leu Asp Ala Asn Lys Val Ala Ala Pro Gly Gln Gln Arg Leu Val
100 105 110

Val Val Ser Val Ser Pro Gln Ser Arg Ala Ser Leu Ala Ala Arg Phe
115 120 125

Gln Leu Asp Ser Thr Asp Thr Ala Arg Lys Leu Thr Ser Phe Phe Lys
130 135 140

Lys Ile Gly Val His Phe Val Phe Asp Thr Ala Phe Ala Arg Asn Phe
145 150 155 160

Ser Leu Leu Glu Ser Gln Lys Glu Phe Val Gln Arg Phe Arg Glu Gln
165 170 175

Ala Asn Ser Arg Glu Ala Leu Pro Met Leu Ala Ser Ala Cys Pro Gly
 180 185 190
 Trp Ile Cys Tyr Ala Glu Lys Thr His Gly Asn Phe Ile Leu Pro Tyr
 195 200 205
 Ile Ser Thr Ala Arg Ser Pro Gln Gln Val Met Gly Ser Leu Ile Lys
 210 215 220
 Asp Phe Phe Ala Gln Gln Gln Leu Leu Thr Pro Asp Lys Ile Tyr His
 225 230 235 240
 Val Thr Val Met Pro Cys Tyr Asp Lys Lys Leu Glu Ala Ser Arg Pro
 245 250 255
 Asp Phe Phe Asn Gln Glu Tyr Gln Thr Arg Asp Val Asp Cys Val Leu
 260 265 270
 Thr Thr Gly Glu Val Phe Arg Leu Leu Glu Glu Glu Gly Val Ser Leu
 275 280 285
 Ser Glu Leu Glu Pro Val Pro Leu Asp Gly Leu Thr Arg Ser Val Ser
 290 295 300
 Ala Glu Glu Pro Thr Ser His Arg Gly Gly Gly Ser Gly Gly Tyr Leu
 305 310 315 320
 Glu His Val Phe Arg His Ala Ala Gln Glu Leu Phe Gly Ile His Val
 325 330 335
 Ala Asp Val Thr Tyr Gln Pro Met Arg Asn Lys Asp Phe Gln Glu Val
 340 345 350
 Thr Leu Glu Arg Glu Gly Gln Val Leu Leu Arg Phe Ala Val Ala Tyr
 355 360 365
 Gly Phe Arg Asn Ile Gln Asn Leu Val Gln Lys Leu Lys Arg Gly Arg
 370 375 380
 Cys Pro Tyr His Tyr Val Glu Val Met Ala Cys Pro Ser Gly Cys Leu
 385 390 395 400
 Asn Gly Gly Gly Gln Leu Lys Ala Pro Asp Thr Glu Gly Arg Glu Leu
 405 410 415
 Leu Gln Gln Val Glu Arg Leu Tyr Ser Met Val Arg Thr Glu Ala Pro
 420 425 430
 Glu Asp Ala Pro Gly Val Gln Glu Leu Tyr Gln His Trp Leu Gln Gly
 435 440 445

Glu Asp Ser Glu Arg Ala Ser His Leu Leu His Thr Gln Tyr His Ala
 450 455 460

Val Glu Lys Ile Asn Ser Gly Leu Ser Ile Arg Trp
 465 470 475

<210> 108
 <211> 525
 <212> PRT
 <213> S. cerevisiae

<400> 108

Met Ala Ser Pro Phe Ser Gly Ala Leu Gln Leu Thr Asp Leu Asp Asp
 1 5 10 15

Phe Ile Gly Pro Ser Gln Val Gly Ser Leu Gln Ala Leu Leu Ala Leu
 20 25 30

Ala Phe Leu His Thr Gly Asn Phe Ser Ala Ala Gly Cys Trp Glu Pro
 35 40 45

Asp Pro Trp Glu Cys Ile Lys Pro Val Lys Val Glu Lys Arg Ala Gly
 50 55 60

Ser Gly Val Ala Lys Ile Arg Ile Glu Asp Asp Gly Ser Tyr Phe Gln
 65 70 75 80

Ile Asn Gln Glu Lys Leu Gly Glu Leu Glu Leu Glu Pro Thr Phe Gly
 85 90 95

Ile Phe Leu Pro Tyr Ser Pro Asp Gly Gly Thr Arg Arg Leu Glu Lys
 100 105 110

Ala Lys Val Ser Leu Asn Asp Cys Leu Ala Cys Ser Gly Cys Ile Thr
 115 120 125

Ser Ala Glu Thr Val Leu Ile Thr Gln Gln Ser His Glu Glu Leu Lys
 130 135 140

Lys Val Leu Asp Ala Asn Lys Met Ala Ala Pro Ser Gln Gln Arg Leu
 145 150 155 160

Val Val Val Ser Val Ser Pro Gln Ser Arg Ala Ser Leu Ala Ala Arg
 165 170 175

Phe Gln Leu Asn Pro Thr Asp Thr Ala Arg Lys Leu Thr Ser Phe Phe
 180 185 190

Lys Lys Ile Gly Val His Phe Val Phe Asp Thr Ala Phe Ser Arg His
 195 200 205

Phe Ser Leu Leu Glu Ser Gln Arg Glu Phe Val Arg Arg Phe Arg Gly
 210 215 220

060513 second sequence listing formatted.txt

Gln Ala Asp Cys Arg Gln Ala Leu Pro Leu Leu Ala Ser Ala Cys Pro
225 230 235 240

Gly Trp Ile Cys Tyr Ala Glu Lys Thr His Gly Ser Phe Ile Leu Pro
245 250 255

His Ile Ser Thr Ala Arg Ser Pro Gln Gln Val Met Gly Ser Leu Val
260 265 270

Lys Asp Phe Phe Ala Gln Gln Gln His Leu Thr Pro Asp Lys Ile Tyr
275 280 285

His Val Thr Val Met Pro Cys Tyr Asp Lys Lys Leu Glu Ala Ser Arg
290 295 300

Pro Asp Phe Phe Asn Gln Glu His Gln Thr Arg Asp Val Asp Cys Val
305 310 315 320

Leu Thr Thr Gly Glu Val Phe Arg Leu Leu Glu Glu Glu Gly Val Ser
325 330 335

Leu Pro Asp Leu Glu Pro Ala Pro Leu Asp Ser Leu Cys Ser Gly Ala
340 345 350

Ser Ala Glu Glu Pro Thr Ser His Arg Gly Gly Gly Ser Gly Gly Tyr
355 360 365

Leu Glu His Val Phe Arg His Ala Ala Arg Glu Leu Phe Gly Ile His
370 375 380

Val Ala Glu Val Thr Tyr Lys Pro Leu Arg Asn Lys Asp Phe Gln Glu
385 390 395 400

Val Thr Leu Glu Lys Glu Gly Gln Val Leu Leu His Phe Ala Met Ala
405 410 415

Tyr Gly Phe Arg Asn Ile Gln Asn Leu Val Gln Arg Leu Lys Arg Gly
420 425 430

Arg Cys Pro Tyr His Tyr Val Glu Val Met Ala Cys Pro Ser Gly Cys
435 440 445

Leu Asn Gly Gly Gly Gln Leu Gln Ala Pro Asp Arg Pro Ser Arg Glu
450 455 460

Leu Leu Gln His Val Glu Arg Leu Tyr Gly Met Val Arg Ala Glu Ala
465 470 475 480

Pro Glu Asp Ala Pro Gly Val Gln Glu Leu Tyr Thr His Trp Leu Gln
485 490 495

Gly Thr Asp Ser Glu Cys Ala Gly Arg Leu Leu His Thr Gln Tyr His

500

505

510

Ala Val Glu Lys Ala Ser Thr Gly Leu Gly Ile Arg Trp
 515 520 525

<210> 109

<211> 572

<212> PRT

<213> C. perfringens

<400> 109

Met Asn Lys Ile Ile Ile Asn Asp Lys Thr Ile Glu Phe Asp Gly Asp
 1 5 10 15

Lys Thr Ile Leu Asp Leu Ala Arg Glu Asn Gly Phe Asp Ile Pro Val
 20 25 30

Leu Cys Glu Leu Lys Asn Cys Gly Asn Lys Gly Gln Cys Gly Val Cys
 35 40 45

Leu Val Glu Gln Glu Gly Asn Asp Arg Leu Leu Arg Ser Cys Ala Ile
 50 55 60

Lys Ala Lys Asp Gly Met Val Ile Lys Thr Asp Ser Glu Lys Val Leu
 65 70 75 80

Glu Ala Arg Lys Glu Arg Val Ala Glu Leu Leu Asp Glu His Glu Phe
 85 90 95

Lys Cys Gly Pro Cys Lys Arg Arg Glu Asn Cys Glu Phe Leu Lys Leu
 100 105 110

Val Ile Lys Thr Lys Ala Arg Ala His Lys Pro Phe Val Val Ala Asp
 115 120 125

Lys Ser Glu Tyr Val Asp Asp Arg Ser Lys Ser Ile Val Leu Asp Arg
 130 135 140

Ser Lys Cys Val Lys Cys Gly Arg Cys Val Ala Ala Cys Arg Thr Arg
 145 150 155 160

Thr Ala Thr Asn Ser Ile Lys Phe His Arg Ile Asp Gly Val Arg Leu
 165 170 175

Val Gly Pro Glu Glu Leu Lys Cys Phe Asp Asp Thr Asn Cys Leu Leu
 180 185 190

Cys Gly Gln Cys Ile Ala Ala Cys Pro Val Asp Ala Leu Ser Glu Lys
 195 200 205

Ser His Ile Glu Arg Val Gln Asp Ala Leu Asn Asp Pro Glu Lys His
 210 215 220

Val Ile Val Ala Met Ala Pro Ala Val Arg Thr Ser Met Gly Glu Leu
 225 230 235 240

 Phe Lys Met Gly Tyr Gly Gln Asp Val Thr Gly Lys Leu Tyr Thr Ala
 245 250 255

 Leu Arg Glu Leu Gly Phe Asp Lys Val Phe Asp Ile Asn Phe Gly Ala
 260 265 270

 Asp Met Thr Ile Met Glu Glu Ala Thr Glu Leu Ile Glu Arg Ile Lys
 275 280 285

 Asn Asn Gly Pro Phe Pro Met Leu Thr Ser Cys Cys Pro Ser Trp Val
 290 295 300

 Arg Glu Val Glu Asn Tyr Phe Pro Glu Leu Val Glu Asn Leu Ser Ser
 305 310 315 320

 Ala Lys Ser Pro Gln Gln Ile Phe Gly Ala Ala Ser Lys Thr Tyr Tyr
 325 330 335

 Pro Gln Val Ala Asp Ile Asp Pro Lys Lys Val Phe Thr Val Thr Val
 340 345 350

 Met Pro Cys Thr Ser Lys Lys Phe Glu Ala Asp Arg Pro Glu Met Glu
 355 360 365

 Asn Glu Gly Ile Arg Asn Ile Asp Ala Val Ile Thr Thr Arg Glu Leu
 370 375 380

 Ala Arg Met Ile Lys Ala Ala Lys Ile Asp Phe Ala Lys Leu Glu Asp
 385 390 395 400

 Gly Glu Val Asp Pro Ala Met Gly Glu Tyr Thr Gly Ala Gly Val Ile
 405 410 415

 Phe Gly Ala Thr Gly Gly Val Met Glu Ala Ala Leu Arg Thr Ala Lys
 420 425 430

 Asp Phe Met Glu Asn Asp Asn Leu Asp Asn Val Asp Tyr Glu Ala Val
 435 440 445

 Arg Gly Leu Ala Gly Ile Lys Glu Ala Glu Val Glu Ile Ala Gly Asn
 450 455 460

 Glu Tyr Lys Leu Ala Val Val Ser Gly Ala Ala Asn Val Phe Glu Leu
 465 470 475 480

 Val Lys Ser Gly Lys Ile Asn Asp Tyr His Phe Ile Glu Val Met Ala
 485 490 495

 Cys Pro Gly Gly Cys Val Asn Gly Gly Gly Gln Pro His Ile Ser Ala
 500 505 510

Glu Asp Ser Asp Lys Ile Asp Ile Arg Glu Val Arg Ala Ser Val Leu
 515 520 525

Tyr Asn Gln Asp Lys Asn Leu Glu Lys Arg Lys Ser His Gln Asn Ser
 530 535 540

Ala Leu Leu Lys Met Tyr Glu Asn Tyr Met Gly Lys Pro Gly His Gly
 545 550 555 560

Arg Ala His Glu Leu Leu His Met Lys Tyr Lys Lys
 565 570

<210> 110
 <211> 572
 <212> PRT
 <213> C. perfringens

<400> 110

Met Asn Lys Ile Ile Ile Asn Asp Lys Thr Ile Glu Phe Asp Gly Asp
 1 5 10 15

Lys Thr Ile Leu Asp Leu Ala Arg Glu Asn Gly Phe Asp Ile Pro Val
 20 25 30

Leu Cys Glu Leu Lys Asn Cys Gly Asn Lys Gly Gln Cys Gly Val Cys
 35 40 45

Leu Val Glu Gln Glu Gly Asn Asp Arg Leu Leu Arg Ser Cys Ala Ile
 50 55 60

Lys Ala Lys Asp Gly Met Val Ile Lys Thr Asp Ser Glu Lys Val Leu
 65 70 75 80

Glu Ala Arg Lys Glu Arg Val Ala Glu Leu Leu Asp Glu His Glu Phe
 85 90 95

Lys Cys Gly Pro Cys Lys Arg Arg Glu Asn Cys Glu Phe Leu Lys Leu
 100 105 110

Val Ile Lys Thr Lys Ala Arg Ala His Lys Pro Phe Val Val Ala Asp
 115 120 125

Lys Ser Glu Tyr Val Asp Asp Arg Ser Lys Ser Ile Val Leu Asp Arg
 130 135 140

Ser Lys Cys Val Lys Cys Gly Arg Cys Val Ala Ala Cys Arg Thr Arg
 145 150 155 160

Thr Ala Thr Asn Ser Ile Lys Phe His Arg Ile Asp Gly Val Arg Leu
 165 170 175

Val Gly Pro Glu Glu Leu Lys Cys Phe Asp Asp Thr Asn Cys Leu Leu

180

185

190

Cys Gly Gln Cys Ile Ala Ala Cys Pro Val Asp Ala Leu Ser Glu Lys
 195 200 205

Ser His Ile Glu Arg Val Gln Glu Ala Leu Asn Asp Pro Glu Lys His
 210 215 220

Val Ile Val Ala Met Ala Pro Ala Val Arg Thr Ser Met Gly Glu Leu
 225 230 235 240

Phe Lys Met Gly Tyr Gly Gln Asp Val Thr Gly Lys Leu Tyr Thr Ala
 245 250 255

Leu Arg Glu Leu Gly Phe Asp Lys Val Phe Asp Ile Asn Phe Gly Ala
 260 265 270

Asp Met Thr Ile Met Glu Glu Ala Thr Glu Leu Ile Glu Arg Ile Lys
 275 280 285

Asn Asn Gly Pro Phe Pro Met Leu Thr Ser Cys Cys Pro Ser Trp Val
 290 295 300

Arg Glu Val Glu Asn Tyr Phe Pro Glu Leu Val Glu Asn Leu Ser Ser
 305 310 315 320

Ala Lys Ser Pro Gln Gln Ile Phe Gly Ala Ala Ser Lys Thr Tyr Tyr
 325 330 335

Pro Gln Val Ala Asp Ile Asp Pro Lys Lys Val Phe Thr Val Thr Val
 340 345 350

Met Pro Cys Thr Ser Lys Lys Phe Glu Ala Asp Arg Pro Glu Met Glu
 355 360 365

Asn Glu Gly Ile Arg Asn Ile Asp Ala Val Ile Thr Thr Arg Glu Leu
 370 375 380

Ala Arg Met Ile Lys Ala Ala Lys Ile Asp Phe Ala Lys Leu Glu Asp
 385 390 395 400

Gly Glu Val Asp Pro Ala Met Gly Glu Tyr Thr Gly Ala Gly Val Ile
 405 410 415

Phe Gly Ala Thr Gly Gly Val Met Glu Ala Ala Leu Arg Thr Ala Lys
 420 425 430

Asp Phe Met Glu Asn Asp Asn Leu Asp Asn Val Asp Tyr Glu Ala Val
 435 440 445

Arg Gly Leu Ala Gly Ile Lys Glu Ala Glu Val Glu Ile Ala Gly Asn
 450 455 460

060513 second sequence listing formatted.txt

Glu Tyr Lys Leu Ala Val Val Ser Gly Ala Ala Asn Val Phe Glu Leu
465 470 475 480

Val Lys Ser Gly Lys Ile Asn Asp Tyr His Phe Ile Glu Val Met Ala
485 490 495

Cys Pro Gly Gly Cys Val Asn Gly Gly Gly Gln Pro His Ile Ser Ala
500 505 510

Glu Asp Ser Asp Lys Met Asp Ile Arg Glu Val Arg Ala Ser Val Leu
515 520 525

Tyr Asn Gln Asp Lys Asn Leu Glu Lys Arg Lys Ser His Gln Asn Ser
530 535 540

Ala Leu Leu Lys Met Tyr Glu Ser Tyr Met Gly Lys Pro Gly His Gly
545 550 555 560

Arg Ala His Glu Leu Leu His Met Lys Tyr Lys Lys
565 570

<210> 111
<211> 494
<212> PRT
<213> C. tetani

<400> 111

Met Ile Val Phe Glu Asn Gln Leu Lys Lys Leu Lys Tyr Leu Val Leu
1 5 10 15

Lys Glu Val Ala Lys Met Thr Leu Glu Asp Arg Leu Gly Glu Glu Asp
20 25 30

Ile Glu Arg Ile Ser Phe Asp Ile Ile Lys Gly Asp Lys Ala Glu Tyr
35 40 45

Arg Cys Cys Val Tyr Lys Glu Arg Ala Ile Val Tyr Glu Arg Ala Lys
50 55 60

Leu Ala Thr Gly Cys Leu Pro Asn Gly Gln Val Ala Glu Glu Phe Val
65 70 75 80

His Val Glu Asp Asp Asp Gln Ile Ile Tyr Val Ile Asp Ala Ala Cys
85 90 95

Asp Lys Cys Pro Ile Asn Lys Tyr Val Val Thr Glu Ala Cys Arg Gly
100 105 110

Cys Leu Gln His Lys Cys Met Glu Val Cys Pro Ala Gly Ser Ile Asn
115 120 125

Arg Ala Ala Gly Lys Ala Tyr Ile Asn His Glu Thr Cys Lys Glu Cys
130 135 140

Gly Leu Cys Glu Ser Ala Cys Pro Tyr Asn Ala Ile Ala Glu Val Met
 145 150 155 160
 Arg Pro Cys Arg Arg Ala Cys Pro Thr Gly Ala Leu Gln Met Asn Leu
 165 170 175
 Glu Asp Asn Lys Ala Thr Ile Asn Lys Glu Asp Cys Ile Asn Cys Gly
 180 185 190
 Ser Cys Met Ser Val Cys Pro Phe Gly Ala Ile Ser Asp Lys Ser Tyr
 195 200 205
 Ile Val Asp Ile Thr Lys Ala Leu Lys Asn Asn Lys Lys Val Tyr Ala
 210 215 220
 Met Val Ala Pro Ala Ile Thr Gly Gln Phe Gly Lys Asp Val Ser Val
 225 230 235 240
 Gly Lys Met Lys Asn Ala Phe Lys Ala Met Gly Phe Glu Asp Met Leu
 245 250 255
 Glu Val Ala Cys Gly Ala Asp Ala Val Ala Ala His Glu Ser Glu Glu
 260 265 270
 Phe Ile Glu Arg Leu Glu Ser Gly Lys Lys Tyr Met Thr Thr Ser Cys
 275 280 285
 Cys Pro Gly Phe Leu Gly Tyr Ile Glu Lys Lys Phe Pro Asp Gln Leu
 290 295 300
 Glu Asn Val Ser Asn Thr Val Ser Pro Met Val Ala Ile Gly Arg Met
 305 310 315 320
 Ile Lys Lys Glu Tyr Glu Asp Ser Val Val Val Phe Val Gly Pro Cys
 325 330 335
 Thr Ala Lys Lys Ala Glu Ile Lys Arg Lys Gly Ile Lys Asp Ala Val
 340 345 350
 Asp Tyr Val Met Thr Phe Glu Glu Ile Ala Ala Leu Met Gly Ala Phe
 355 360 365
 Glu Ile Asp Pro Ala Glu Cys Glu Glu Glu Asp Ile Asn Asp Gly Ser
 370 375 380
 Asn Tyr Gly Arg Gly Phe Ala Gln Gly Gly Gly Val Val Ser Ala Ile
 385 390 395 400
 Gln Asn Cys Ile Lys Asp Lys Glu Gly Ile Lys Phe Asn Pro Leu Arg
 405 410 415

Val Ser Gly Pro Asp Gln Ile Lys Arg Ala Met Ile Met Ala Lys Val
 420 425 430

Gly Lys Leu Ser Glu Asn Phe Ile Glu Gly Met Met Cys Glu Gly Gly
 435 440 445

Cys Ile Gly Gly Pro Ala Thr Met Val Ser Ala Val Lys Ala Lys Ala
 450 455 460

Pro Leu Met Lys Phe Ser Lys Ser Ser Thr Ile Lys Asp Val Lys Asp
 465 470 475 480

Asn Glu Val Leu Asp Lys Tyr Lys Asp Ile Asn Met Glu Arg
 485 490

<210> 112
 <211> 448
 <212> PRT
 <213> C. tetani

<400> 112

Met His Asn Asp Tyr Arg Glu Ile Phe Lys Arg Leu Ser Lys Ser Tyr
 1 5 10 15

Tyr Asp Asp Thr Phe Glu Lys Glu Val Glu Asn Ile Leu Ser Ser His
 20 25 30

Ser Met Asp Arg Glu Lys Leu Ala Lys Ile Ile Ser Ile Leu Cys Gly
 35 40 45

Val Asn Ile Glu His Ser Glu Asn Tyr Ile Ser Asn Leu Lys Asn Ala
 50 55 60

Ile Lys Asn Tyr Thr Ala Ser Ala Glu Lys Val Val Thr Lys Leu Pro
 65 70 75 80

Cys Ser Thr Gln Cys Ala Lys Asp Gly Asp Ile Ile Cys Glu Lys Ser
 85 90 95

Cys Pro Val Asn Ala Ile Phe Arg Asp Pro Asn Asp Asn Asn Ile Tyr
 100 105 110

Ile Asn Asp Glu Leu Cys Leu Asp Cys Gly Leu Cys Val Arg Asn Cys
 115 120 125

Pro Ser Gly Ser Ile Leu Asp Lys Lys Glu Phe Ile Pro Leu Ala Glu
 130 135 140

Leu Leu Lys Ser Glu Ser Ile Val Ile Ala Ala Val Ala Pro Ala Ile
 145 150 155 160

Met Gly Gln Phe Gly Glu Asn Thr Thr Ile Asn Gln Leu Arg Thr Ala
 165 170 175

060513 second sequence listing formatted.txt

Phe Lys Lys Leu Gly Phe Thr Asp Met Val Glu Val Ala Phe Phe Ala
180 185 190

Asp Met Leu Thr Leu Lys Glu Ala Val Glu Tyr Asp His Phe Val Lys
195 200 205

Asp Glu Gln Asp Phe Met Ile Thr Ser Cys Cys Cys Pro Met Trp Val
210 215 220

Gly Met Leu Lys Lys Val Tyr Asn Asp Leu Val Lys Tyr Val Ser Pro
225 230 235 240

Ser Val Ser Pro Met Ile Ala Ala Gly Arg Val Leu Lys Leu Leu Asn
245 250 255

Pro Asn Cys Lys Val Val Phe Val Gly Pro Cys Ile Ala Lys Lys Ala
260 265 270

Glu Ala Arg Glu Lys Asp Leu Leu Gly Asp Ile Asp Phe Val Leu Thr
275 280 285

Phe Thr Glu Leu Arg Asp Ile Phe Asp Val Phe Asp Ile Gln Pro Glu
290 295 300

Asn Leu Glu Glu Asp Phe Ser Ser Glu Tyr Ala Ser Lys Gly Gly Arg
305 310 315 320

Leu Tyr Ala Arg Thr Gly Gly Val Ser Ile Ala Val Ser Glu Ala Ile
325 330 335

Glu Lys Leu Phe Pro Asn Lys Tyr Lys Phe Leu Lys Thr Ile Gln Ala
340 345 350

Asp Gly Val Lys Gly Cys Lys Ser Leu Leu Asp Lys Ile Lys Gln Glu
355 360 365

Asp Ile Ser Ala Asn Phe Val Glu Gly Met Gly Cys Val Gly Gly Cys
370 375 380

Val Gly Gly Pro Lys Val Ile Ile Asp Pro Ser Glu Gly Arg Asn Ala
385 390 395 400

Val Asn Asn Phe Ala Glu Asn Ser Ser Ile Lys Val Ser Val Asp Ser
405 410 415

Asn Cys Met Asn Asp Ile Leu Ser Lys Ile Asn Ile Asn Ser Val Glu
420 425 430

Asp Phe Lys Asp Lys Asp Lys Ile Ser Ile Phe Glu Arg Glu Phe Lys
435 440 445

<211> 261
 <212> PRT
 <213> Pyrococcus furiosus

<400> 113

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Met Gly Lys Val Arg Ile Gly Phe Tyr Ala Leu Thr Ser Cys Tyr Gly
1      5      10      15
Cys Gln Leu Gln Leu Ala Met Met Asp Glu Leu Leu Gln Leu Ile Pro
20     25     30
Asn Ala Glu Ile Val Cys Trp Phe Met Ile Asp Arg Asp Ser Ile Glu
35     40     45
Asp Glu Lys Val Asp Ile Ala Phe Ile Glu Gly Ser Val Ser Thr Glu
50     55     60
Glu Glu Val Glu Leu Val Lys Lys Ile Arg Glu Asn Ala Lys Ile Val
65     70     75     80
Val Ala Val Gly Ala Cys Ala Val Gln Gly Gly Val Gln Ser Trp Ser
85     90     95
Glu Lys Pro Leu Glu Glu Leu Trp Lys Lys Val Tyr Gly Asp Ala Lys
100    105    110
Val Lys Phe Gln Pro Lys Lys Ala Glu Pro Val Ser Lys Tyr Ile Lys
115    120    125
Val Asp Tyr Asn Ile Tyr Gly Cys Pro Pro Glu Lys Lys Asp Phe Leu
130    135    140
Tyr Ala Leu Gly Thr Phe Leu Ile Gly Ser Trp Pro Glu Asp Ile Asp
145    150    155    160
Tyr Pro Val Cys Leu Glu Cys Arg Leu Asn Gly His Pro Cys Ile Leu
165    170    175
Leu Glu Lys Gly Glu Pro Cys Leu Gly Pro Val Thr Arg Ala Gly Cys
180    185    190
Asn Ala Arg Cys Pro Gly Phe Gly Val Ala Cys Ile Gly Cys Arg Gly
195    200    205
Ala Ile Gly Tyr Asp Val Ala Trp Phe Asp Ser Leu Ala Lys Val Phe
210    215    220
Lys Glu Lys Gly Met Thr Lys Glu Glu Ile Ile Glu Arg Met Lys Met
225    230    235    240
Phe Asn Gly His Asp Glu Arg Val Glu Lys Met Val Glu Lys Ile Phe
245    250    255

```

Ser Gly Gly Glu Gln
260

<210> 114
<211> 252
<212> PRT
<213> Escherichia coli

<400> 114

Met Ser Pro Val Leu Thr Gln His Val Ser Gln Pro Ile Thr Leu Asp
1 5 10 15

Glu Gln Thr Gln Lys Met Lys Arg His Leu Leu Gln Asp Ile Arg Arg
20 25 30

Ser Ala Tyr Val Tyr Arg Val Asp Cys Gly Gly Cys Asn Ala Cys Glu
35 40 45

Ile Glu Ile Phe Ala Ala Ile Thr Pro Val Phe Asp Ala Glu Arg Phe
50 55 60

Gly Ile Lys Val Val Ser Ser Pro Arg His Ala Asp Ile Leu Leu Phe
65 70 75 80

Thr Gly Ala Val Thr Arg Ala Met Arg Met Pro Ala Leu Arg Ala Tyr
85 90 95

Glu Ser Ala Pro Asp His Lys Ile Cys Val Ser Tyr Gly Ala Cys Gly
100 105 110

Val Gly Gly Gly Ile Phe His Asp Leu Tyr Ser Val Trp Gly Gly Ser
115 120 125

Asp Thr Ile Val Pro Ile Asp Val Trp Ile Pro Gly Cys Pro Pro Thr
130 135 140

Pro Ala Ala Thr Ile His Gly Phe Ala Val Ala Leu Gly Leu Leu Gln
145 150 155 160

Gln Lys Ile His Ala Val Asp Tyr Arg Asp Pro Thr Gly Val Thr Met
165 170 175

Gln Pro Leu Trp Pro Gln Ile Pro Pro Ser Gln Arg Ile Ala Ile Glu
180 185 190

Arg Glu Ala Arg Arg Leu Ala Gly Tyr Arg Gln Gly Arg Glu Ile Cys
195 200 205

Asp Arg Leu Leu Arg His Leu Ser Asp Asp Pro Thr Gly Asn Arg Val
210 215 220

Asn Thr Trp Leu Arg Asp Ala Asp Asp Pro Arg Leu Asn Ser Ile Val
225 230 235 240

Gln Gln Leu Phe Arg Val Leu Arg Gly Leu His Asp
 245 250

<210> 115
 <211> 236
 <212> PRT
 <213> Methanothermobacter thermautotrophicus

<400> 115

Met Ala Glu Glu Asn Ala Lys Pro Arg Ile Gly Tyr Ile His Leu Ser
 1 5 10 15

Gly Cys Thr Gly Asp Ala Met Ser Leu Thr Glu Asn Tyr Asp Ile Leu
 20 25 30

Ala Glu Leu Leu Thr Asn Met Val Asp Ile Val Tyr Gly Gln Thr Leu
 35 40 45

Val Asp Leu Trp Glu Met Pro Glu Met Asp Leu Ala Leu Val Glu Gly
 50 55 60

Ser Val Cys Leu Gln Asp Glu His Ser Leu His Glu Leu Lys Glu Leu
 65 70 75 80

Arg Glu Lys Ala Lys Leu Val Cys Ala Phe Gly Ser Cys Ala Gln Thr
 85 90 95

Gly Cys Phe Thr Arg Tyr Ser Arg Gly Gly Gln Gln Ala Gln Pro Ser
 100 105 110

His Glu Ser Phe Val Pro Ile Ala Asp Leu Ile Asp Val Asp Leu Ala
 115 120 125

Ile Pro Gly Cys Pro Pro Ser Pro Glu Ile Ile Ala Lys Ala Val Val
 130 135 140

Ala Leu Leu Asn Asn Asp Met Glu Tyr Leu Gln Pro Met Leu Asp Leu
 145 150 155 160

Ala Gly Tyr Thr Glu Ala Cys Gly Cys Asp Leu Gln Thr Lys Val Val
 165 170 175

Asn Gln Gly Leu Cys Thr Gly Cys Gly Thr Cys Ala Met Ala Cys Gln
 180 185 190

Thr Arg Ala Leu Asp Met Thr Asn Gly Arg Pro Glu Leu Asn Ser Asp
 195 200 205

Arg Cys Ile Lys Cys Gly Ile Cys Tyr Val Gln Cys Pro Arg Ser Trp
 210 215 220

Trp Pro Glu Glu Gln Ile Lys Lys Glu Leu Gly Leu
 225 230 235

<210> 116
 <211> 259
 <212> PRT
 <213> Methanosarcina barkeri

<400> 116

Met Ala Asn Lys Ile Lys Leu Gly His Val His Leu Ser Gly Cys Thr
 1 5 10 15

Gly Cys Leu Val Ser Val Ala Asp Asn Tyr Gln Gly Phe Leu Lys Ile
 20 25 30

Leu Asp Asp Tyr Ala Asp Leu Val Tyr Cys Leu Thr Leu Ala Asp Val
 35 40 45

Arg His Ile Pro Glu Met Asp Val Ala Leu Val Glu Gly Ser Val Cys
 50 55 60

Ile Gln Asp Arg Glu Ser Val Glu Asp Ile Lys Glu Thr Arg Lys Lys
 65 70 75 80

Ser Arg Ile Val Val Ala Leu Gly Ser Cys Ala Ser Tyr Gly Asn Ile
 85 90 95

Thr Arg Phe Cys Arg Gly Gly Gln His Asn His Pro Gln His Glu Ser
 100 105 110

Tyr Leu Pro Ile Gly Asp Leu Ile Asp Val Asp Val Tyr Ile Pro Gly
 115 120 125

Cys Pro Pro Ser Pro Glu Leu Ile Arg Asn Val Ala Ile Met Ala Tyr
 130 135 140

Leu Leu Leu Glu Gly Asn Glu Glu Gln Lys Asp Leu Ala Gly Arg Tyr
 145 150 155 160

Leu Lys Pro Leu Met Asp Leu Ala Lys Arg Gly Thr Thr Gly Cys Phe
 165 170 175

Cys Asp Leu Met Asp Asp Val Ile Asn Gln Gly Leu Cys Ile Gly Cys
 180 185 190

Gly Ile Cys Ala Ala Ser Cys Pro Val Arg Ala Ile Thr His Glu Phe
 195 200 205

Gly Lys Pro Gln Gly Asp Leu Asn Leu Cys Ile Lys Cys Gly Ser Cys
 210 215 220

Tyr Gly Ala Cys Pro Arg Ser Phe Phe Asn Pro Asp Val Ile Ser Glu
 225 230 235 240

Phe Glu Ser Ile Asn Glu Ile Ile Ala Gly Ala Leu Lys Glu Gly Glu

Lys Asp Asp

<210> 117
<211> 142
<212> PRT
<213> Rhodospirillum rubrum

<400> 117

Met Asn Phe Leu Ser Arg Met Ser Lys Lys Ser Pro Trp Leu Tyr Arg
1 5 10 15

Ile Asn Ala Gly Ser Cys Asn Gly Cys Asp Val Glu Leu Ala Thr Thr
20 25 30

Ala Cys Ile Pro Arg Tyr Asp Val Glu Arg Leu Gly Cys Gln Tyr Cys
35 40 45

Gly Ser Pro Lys His Ala Asp Ile Val Leu Val Thr Gly Pro Leu Thr
50 55 60

Ala Arg Val Lys Asp Lys Val Leu Arg Val Tyr Glu Glu Ile Pro Asp
65 70 75 80

Pro Lys Val Thr Val Ala Ile Gly Val Cys Pro Ile Ser Gly Gly Val
85 90 95

Phe Arg Glu Ser Tyr Ser Ile Val Gly Pro Ile Asp Arg Tyr Leu Pro
100 105 110

Val Asp Val Asn Val Pro Gly Cys Pro Pro Arg Pro Gln Ala Ile Ile
115 120 125

Glu Gly Ile Ala Lys Ala Ile Glu Ile Trp Ala Gly Arg Ile
130 135 140

<210> 118
<211> 428
<212> PRT
<213> Pyrococcus furiosus

<400> 118

Met Lys Asn Leu Tyr Leu Pro Ile Thr Ile Asp His Ile Ala Arg Val
1 5 10 15

Glu Gly Lys Gly Gly Val Glu Ile Ile Ile Gly Asp Asp Gly Val Lys
20 25 30

Glu Val Lys Leu Asn Ile Ile Glu Gly Pro Arg Phe Phe Glu Ala Ile
35 40 45

Thr Ile Gly Lys Lys Leu Glu Glu Ala Leu Ala Ile Tyr Pro Arg Ile

50

55

60

Cys Ser Phe Cys Ser Ala Ala His Lys Leu Thr Ala Leu Glu Ala Ala
65 70 75 80

Glu Lys Ala Val Gly Phe Val Pro Arg Glu Glu Ile Gln Ala Leu Arg
85 90 95

Glu Val Leu Tyr Ile Gly Asp Met Ile Glu Ser His Ala Leu His Leu
100 105 110

Tyr Leu Leu Val Leu Pro Asp Tyr Arg Gly Tyr Ser Ser Pro Leu Lys
115 120 125

Met Val Asn Glu Tyr Lys Arg Glu Ile Glu Ile Ala Leu Lys Leu Lys
130 135 140

Asn Leu Gly Thr Trp Met Met Asp Ile Leu Gly Ser Arg Ala Ile His
145 150 155 160

Gln Glu Asn Ala Val Leu Gly Gly Phe Gly Lys Leu Pro Glu Lys Ser
165 170 175

Val Leu Glu Lys Met Lys Ala Glu Leu Arg Glu Ala Leu Pro Leu Ala
180 185 190

Glu Tyr Thr Phe Glu Leu Phe Ala Lys Leu Glu Gln Tyr Ser Glu Val
195 200 205

Glu Gly Pro Ile Thr His Leu Ala Val Lys Pro Arg Gly Asp Ala Tyr
210 215 220

Gly Ile Tyr Gly Asp Tyr Ile Lys Ala Ser Asp Gly Glu Glu Phe Pro
225 230 235 240

Ser Glu Lys Tyr Arg Asp Tyr Ile Lys Glu Phe Val Val Glu His Ser
245 250 255

Phe Ala Lys His Ser His Tyr Lys Gly Arg Pro Phe Met Val Gly Ala
260 265 270

Ile Ser Arg Val Ile Asn Asn Ala Asp Leu Leu Tyr Gly Lys Ala Lys
275 280 285

Glu Leu Tyr Glu Ala Asn Lys Asp Leu Leu Lys Gly Thr Asn Pro Phe
290 295 300

Ala Asn Asn Leu Ala Gln Ala Leu Glu Ile Val Tyr Phe Ile Glu Arg
305 310 315 320

Ala Ile Asp Leu Leu Asp Glu Ala Leu Ala Lys Trp Pro Ile Lys Pro
325 330 335

Arg Asp Glu Val Glu Ile Lys Asp Gly Phe Gly Val Ser Thr Thr Glu
 340 345 350

Ala Pro Arg Gly Ile Leu Val Tyr Ala Leu Lys Val Glu Asn Gly Arg
 355 360 365

Val Ser Tyr Ala Asp Ile Ile Thr Pro Thr Ala Phe Asn Leu Ala Met
 370 375 380

Met Glu Glu His Val Arg Met Met Ala Glu Lys His Tyr Asn Asp Asp
 385 390 395 400

Pro Glu Arg Leu Lys Ile Leu Ala Glu Met Val Val Arg Ala Tyr Asp
 405 410 415

Pro Cys Ile Ser Cys Ser Val His Val Val Arg Leu
 420 425

<210> 119
 <211> 555
 <212> PRT
 <213> Escherichia coli

<400> 119

Met Asn Val Asn Ser Ser Ser Asn Arg Gly Glu Ala Ile Leu Ala Ala
 1 5 10 15

Leu Lys Thr Gln Phe Pro Gly Ala Val Leu Asp Glu Glu Arg Gln Thr
 20 25 30

Pro Glu Gln Val Thr Ile Thr Val Lys Ile Asn Leu Leu Pro Asp Val
 35 40 45

Val Gln Tyr Leu Tyr Tyr Gln His Asp Gly Trp Leu Pro Val Leu Phe
 50 55 60

Gly Asn Asp Glu Arg Thr Leu Asn Gly His Tyr Ala Val Tyr Tyr Ala
 65 70 75 80

Leu Ser Met Glu Gly Ala Glu Lys Cys Trp Ile Val Val Lys Ala Leu
 85 90 95

Val Asp Ala Asp Ser Arg Glu Phe Pro Ser Val Thr Pro Arg Val Pro
 100 105 110

Ala Ala Val Trp Gly Glu Arg Glu Ile Arg Asp Met Tyr Gly Leu Ile
 115 120 125

Pro Val Gly Leu Pro Asp Gln Arg Arg Leu Val Leu Pro Asp Asp Trp
 130 135 140

Pro Glu Asp Met His Pro Leu Arg Lys Asp Ala Met Asp Tyr Arg Leu
 145 150 155 160

Arg Pro Glu Pro Thr Thr Asp Ser Glu Thr Tyr Pro Phe Ile Asn Glu
 165 170 175
 Gly Asn Ser Asp Ala Arg Val Ile Pro Val Gly Pro Leu His Ile Thr
 180 185 190
 Ser Asp Glu Pro Gly His Phe Arg Leu Phe Val Asp Gly Glu Gln Ile
 195 200 205
 Val Asp Ala Asp Tyr Arg Leu Phe Tyr Val His Arg Gly Met Glu Lys
 210 215 220
 Leu Ala Glu Thr Arg Met Gly Tyr Asn Glu Val Thr Phe Leu Ser Asp
 225 230 235 240
 Arg Val Cys Gly Ile Cys Gly Phe Ala His Ser Val Ala Tyr Thr Asn
 245 250 255
 Ser Val Glu Asn Ala Leu Gly Ile Glu Val Pro Gln Arg Ala His Thr
 260 265 270
 Ile Arg Ser Ile Leu Leu Glu Val Glu Arg Leu His Ser His Leu Leu
 275 280 285
 Asn Leu Gly Leu Ser Cys His Phe Val Gly Phe Asp Thr Gly Phe Met
 290 295 300
 Gln Phe Phe Arg Val Arg Glu Lys Ser Met Thr Met Ala Glu Leu Leu
 305 310 315 320
 Ile Gly Ser Arg Lys Thr Tyr Gly Leu Asn Leu Ile Gly Gly Val Arg
 325 330 335
 Arg Asp Ile Leu Lys Glu Gln Arg Leu Gln Thr Leu Lys Leu Val Arg
 340 345 350
 Glu Met Arg Ala Asp Val Ser Glu Leu Val Glu Met Leu Leu Ala Thr
 355 360 365
 Pro Asn Met Glu Gln Arg Thr Gln Gly Ile Gly Ile Leu Asp Arg Gln
 370 375 380
 Ile Ala Arg Asp Leu Arg Phe Asp His Pro Tyr Ala Asp Tyr Gly Asn
 385 390 395 400
 Ile Pro Lys Thr Leu Phe Thr Phe Thr Gly Gly Asp Val Phe Ser Arg
 405 410 415
 Val Met Val Arg Val Lys Glu Thr Phe Asp Ser Leu Ala Met Leu Glu
 420 425 430

Phe Ala Leu Asp Asn Met Pro Asp Thr Pro Leu Leu Thr Glu Gly Phe
 435 440 445

Ser Tyr Lys Pro His Ala Phe Ala Leu Gly Phe Val Glu Ala Pro Arg
 450 455 460

Gly Glu Asp Val His Trp Ser Met Leu Gly Asp Asn Gln Lys Leu Phe
 465 470 475 480

Arg Trp Arg Cys Arg Ala Ala Thr Tyr Ala Asn Trp Pro Val Leu Arg
 485 490 495

Tyr Met Leu Arg Gly Asn Thr Val Ser Asp Ala Pro Leu Ile Ile Gly
 500 505 510

Ser Leu Asp Pro Cys Tyr Ser Cys Thr Asp Arg Val Thr Leu Val Asp
 515 520 525

Val Arg Lys Arg Gln Ser Lys Thr Val Pro Tyr Lys Glu Ile Glu Arg
 530 535 540

Tyr Gly Ile Asp Arg Asn Arg Ser Pro Leu Lys
 545 550 555

<210> 120

<211> 405

<212> PRT

<213> Methanothermobacter thermautotrophicus

<400> 120

Met Ser Glu Arg Ile Val Ile Ser Pro Thr Ser Arg Gln Glu Gly His
 1 5 10 15

Ala Glu Leu Val Met Glu Val Asp Asp Glu Gly Ile Val Thr Lys Gly
 20 25 30

Arg Tyr Phe Ser Ile Thr Pro Val Arg Gly Leu Glu Lys Ile Val Thr
 35 40 45

Gly Lys Ala Pro Glu Thr Ala Pro Val Ile Val Gln Arg Ile Cys Gly
 50 55 60

Val Cys Pro Ile Pro His Thr Leu Ala Ser Val Glu Ala Ile Asp Asp
 65 70 75 80

Ser Leu Asp Ile Glu Val Pro Lys Ala Gly Arg Leu Leu Arg Glu Leu
 85 90 95

Thr Leu Ala Ala His His Val Asn Ser His Ala Ile His His Phe Leu
 100 105 110

Ile Ala Pro Asp Phe Val Pro Glu Asn Leu Met Ala Asp Ala Ile Asn
 115 120 125

060513 second sequence listing formatted.txt

Ser Val Ser Glu Ile Arg Lys Asn Ala Gln Tyr Val Val Asp Met Val
130 135 140

Ala Gly Glu Gly Ile His Pro Ser Asp Val Arg Ile Gly Gly Met Ala
145 150 155 160

Asp Asn Ile Thr Glu Leu Ala Arg Lys Arg Leu Tyr Ala Arg Leu Lys
165 170 175

Gln Leu Lys Pro Lys Val Asp Glu His Val Glu Leu Met Ile Gly Leu
180 185 190

Ile Glu Asp Lys Gly Leu Pro Lys Gly Leu Gly Val His Asn Gln Pro
195 200 205

Thr Leu Ala Ser His Gln Ile Tyr Gly Asp Arg Thr Lys Phe Asp Leu
210 215 220

Asp Arg Phe Thr Glu Val Met Pro Glu Ser Trp Tyr Asp Asp Pro Glu
225 230 235 240

Ile Ala Lys Arg Ala Cys Ser Thr Ile Pro Leu Tyr Asp Gly Arg Asn
245 250 255

Val Glu Val Gly Pro Arg Ala Arg Met Val Glu Phe Gln Gly Phe Lys
260 265 270

Glu Arg Gly Val Val Ala Gln His Val Ala Arg Ala Leu Glu Met Lys
275 280 285

Thr Ala Leu Ala Arg Ala Ile Glu Ile Leu Asp Glu Leu Asp Thr Ser
290 295 300

Ala Pro Val Arg Ala Asp Phe Asp Glu Arg Gly Thr Gly Lys Leu Gly
305 310 315 320

Val Gly Ala Ile Glu Gly Pro Arg Gly Leu Asp Val His Met Ala Gln
325 330 335

Val Glu Asn Gly Lys Ile Gln Phe Tyr Ser Ala Leu Val Pro Thr Thr
340 345 350

Trp Asn Ile Pro Thr Met Gly Pro Ala Thr Glu Gly Phe His His Glu
355 360 365

Tyr Gly Pro His Val Ile Arg Ala Tyr Asp Pro Cys Leu Ser Cys Ala
370 375 380

Thr His Val Met Val Val Asp Asp Glu Asp Arg Ser Val Ile Arg Asp
385 390 395 400

Glu Met Val Arg Leu

<210> 121
<211> 456
<212> PRT
<213> Methanosarcina barkeri

<400> 121

Met Thr Lys Val Val Glu Ile Ser Pro Thr Thr Arg His Glu Gly His
1 5 10 15

Ser Lys Leu Thr Leu Lys Val Asn Asp Glu Gly Ile Val Glu Arg Gly
20 25 30

Asp Trp Leu Ser Thr Thr Pro Val Arg Gly Ile Glu Lys Leu Ala Ile
35 40 45

Gly Lys Thr Met Asp Gln Val Pro Lys Ile Ala Ser Arg Val Cys Gly
50 55 60

Ile Cys Pro Ile Ala His Thr Leu Ala Gly Ile Glu Ala Met Glu Ala
65 70 75 80

Ser Ile Gly Cys Glu Ile Pro Lys Asp Ala Lys Leu Leu Arg Val Ile
85 90 95

Leu His Ala Ala Asn Arg Leu His Ser His Ala Leu His Asn Ile Leu
100 105 110

Ile Leu Pro Asp Phe Tyr Ile Pro Asp Thr Glu Thr Lys Ile Asn Pro
115 120 125

Phe Ser Lys Glu Gln Pro Leu Arg Ser Val Ala Val Arg Ile Phe Arg
130 135 140

Ile Arg Glu Ile Ala Gln Thr Ile Gly Ala Val Ala Gly Gly Glu Ala
145 150 155 160

Ile His Pro Ser Asn Pro Arg Val Gly Gly Met Tyr Arg Asn Val Ser
165 170 175

Ser Arg Ala Lys Gln Lys Ile Ala Asp Leu Ala Lys Glu Gly Leu Val
180 185 190

Leu Ala His Glu Gln Met Glu Phe Met Ile Glu Val Ile Arg Asn Met
195 200 205

Gln Asp Arg Glu Phe Val Glu Val Ala Gly Lys Gln Ile Pro Leu Pro
210 215 220

Lys Thr Leu Gly Tyr His Asn Gln Gly Val Met Ala Thr Ala Pro Met
225 230 235 240

Tyr Gly Ser Ser Ser Leu Asp Glu Lys Pro Met Trp Asp Phe Thr Arg
245 250 255

Trp Arg Glu Thr Arg Pro Trp Asp Trp Tyr Met Ser Glu Glu Thr Ile
260 265 270

Asp Leu Glu Asp Ser Ser Tyr Pro Ile Gly Gly Thr Thr Lys Val Gly
275 280 285

Thr Lys Val Asn Pro Arg Met Glu Ala Cys Asn Thr Val Pro Thr Tyr
290 295 300

Asp Gly Gln Pro Val Glu Val Gly Pro Arg Ala Arg Leu Ala Thr Phe
305 310 315 320

Lys His Phe Thr Glu Lys Gly Thr Phe Ala Gln His Ile Ala Arg Gln
325 330 335

Met Glu Tyr Thr Asp Cys Tyr Tyr Thr Ile Leu Asn Cys Leu Glu Asn
340 345 350

Leu Asp Thr Ser Gly Lys Val Leu Ala Asp Thr Ile Pro Leu Gly Asn
355 360 365

Gly Ser Met Gly Trp Ala Ala Asn Glu Ala Pro Arg Gly Thr Asp Val
370 375 380

His Leu Ala Arg Val Lys Asp Gly Lys Val Leu Arg Tyr Glu Met Leu
385 390 395 400

Val Pro Thr Thr Trp Asn Phe Pro Thr Cys Ser Arg Ala Leu Thr Gly
405 410 415

Ala Pro Trp Gln Ile Ala Glu Met Val Ile Arg Ala Tyr Asp Pro Cys
420 425 430

Val Ser Cys Ala Thr His Met Ile Val Val Asn Glu Glu Asp Arg Ile
435 440 445

Val Ala Gln Lys Leu Met Gln Trp
450 455

<210> 122
<211> 361
<212> PRT
<213> Rhodospirillum rubrum

<400> 122

Met Ser Thr Tyr Thr Ile Pro Val Gly Pro Leu His Val Ala Leu Glu
1 5 10 15

Glu Pro Met Tyr Phe Arg Ile Glu Val Asp Gly Glu Lys Val Val Ser
20 25 30

060513 second sequence listing formatted.txt

Val Asp Ile Thr Ala Gly His Val His Arg Gly Ile Glu Tyr Leu Ala
35 40 45

Thr Lys Arg Asn Ile Tyr Gln Asn Ile Val Leu Thr Glu Arg Val Cys
50 55 60

Ser Leu Cys Ser Asn Ser His Pro Gln Thr Tyr Cys Met Ala Leu Glu
65 70 75 80

Ser Ile Thr Gly Met Val Val Pro Pro Arg Ala Gln Tyr Leu Arg Val
85 90 95

Ile Ala Asp Glu Thr Lys Arg Val Ala Ser His Met Phe Asn Val Ala
100 105 110

Ile Leu Ala His Ile Val Gly Phe Asp Ser Leu Phe Met His Val Met
115 120 125

Glu Ala Arg Glu Ile Met Gln Asp Thr Lys Glu Ala Val Phe Gly Asn
130 135 140

Arg Met Asp Ile Ala Ala Met Ala Ile Gly Gly Val Lys Tyr Asp Leu
145 150 155 160

Asp Lys Asp Gly Arg Asp Tyr Phe Ile Gly Gln Leu Asp Lys Leu Glu
165 170 175

Pro Thr Leu Arg Asp Glu Ile Ile Pro Leu Tyr Gln Thr Asn Pro Ser
180 185 190

Ile Val Asp Arg Thr Arg Gly Ile Gly Val Leu Ser Ala Ala Asp Cys
195 200 205

Val Asp Tyr Gly Leu Met Gly Pro Val Ala Arg Gly Ser Gly His Ala
210 215 220

Tyr Asp Val Arg Lys Gln Ala Pro Tyr Ala Val Tyr Asp Arg Leu Asp
225 230 235 240

Phe Glu Met Ala Leu Gly Glu His Gly Asp Val Trp Ser Arg Ala Met
245 250 255

Val Arg Trp Gln Glu Ala Leu Thr Ser Ile Gly Leu Ile Arg Gln Cys
260 265 270

Leu Arg Asp Met Pro Asp Gly Pro Thr Lys Ala Gly Pro Val Pro Pro
275 280 285

Ile Pro Ala Gly Glu Ala Val Ala Lys Thr Glu Ala Pro Arg Gly Glu
290 295 300

Leu Ile Tyr Tyr Leu Lys Thr Asn Gly Thr Asp Arg Pro Glu Arg Leu

180

185

190

Ser Cys Lys Ser Pro Gln Met Met Met Gly Ala Met Val Lys Thr Tyr
 195 200 205

Leu Ser Glu Lys Gln Gly Ile Pro Ala Lys Asp Ile Val Met Val Ser
 210 215 220

Val Met Pro Cys Val Arg Lys Gln Gly Glu Ala Asp Arg Glu Trp Phe
 225 230 235 240

Cys Val Ser Glu Pro Gly Val Arg Asp Val Asp His Val Ile Thr Thr
 245 250 255

Ala Glu Leu Gly Asn Ile Phe Lys Glu Arg Gly Ile Asn Leu Pro Glu
 260 265 270

Leu Pro Asp Ser Asp Trp Asp Gln Pro Leu Gly Leu Gly Ser Gly Ala
 275 280 285

Gly Val Leu Phe Gly Thr Thr Gly Gly Val Met Glu Ala Ala Leu Arg
 290 295 300

Thr Ala Tyr Glu Ile Val Thr Lys Glu Pro Leu Pro Arg Leu Asn Leu
 305 310 315 320

Ser Glu Val Arg Gly Leu Asp Gly Ile Lys Glu Ala Ser Val Thr Leu
 325 330 335

Val Pro Ala Pro Gly Ser Lys Phe Ala Glu Leu Val Ala Glu Arg Leu
 340 345 350

Ala His Lys Val Glu Glu Ala Ala Ala Glu Ala Ala Ala Val
 355 360 365

Glu Gly Ala Val Lys Pro Pro Ile Ala Tyr Asp Gly Gly Gln Gly Phe
 370 375 380

Ser Thr Asp Asp Gly Lys Gly Gly Leu Lys Leu Arg Val Ala Val Ala
 385 390 395 400

Asn Gly Leu Gly Asn Ala Lys Lys Leu Ile Gly Lys Met Val Ser Gly
 405 410 415

Glu Ala Lys Tyr Asp Phe Val Glu Ile Met Ala Cys Pro Ala Gly Cys
 420 425 430

Val Gly Gly Gly Gly Gln Pro Arg Ser Thr Asp Lys Gln Ile Thr Gln
 435 440 445

Lys Arg Gln Ala Ala Leu Tyr Asp Leu Asp Glu Arg Asn Thr Leu Arg
 450 455 460

Arg Ser His Glu Asn Glu Ala Val Asn Gln Leu Tyr Lys Glu Phe Leu
 465 470 475 480

Gly Glu Pro Leu Ser His Arg Ala His Glu Leu Leu His Thr His Tyr
 485 490 495

Val Pro Gly Gly Ala Glu Ala Asp Ala
 500 505

<210> 124
 <211> 19
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Synthetic sequence

<400> 124

Gly Ala Gly Val Ile Phe Gly Ala Thr Gly Gly Val Met Glu Ala Ala
 1 5 10 15

Leu Arg Thr

<210> 125
 <211> 19
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Synthetic sequence

<400> 125

Gly Gly Gly Ala Ile Phe Cys Ala Thr Gly Gly Val Met Glu Ala Ala
 1 5 10 15

Val Arg Ser

<210> 126
 <211> 19
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Synthetic sequence

<400> 126

Gly Gly Ala Thr Ile Phe Gly Val Thr Gly Gly Val Met Glu Ala Ala
 1 5 10 15

Leu Arg Phe

<210> 127
 <211> 19
 <212> PRT

<213> Artificial sequence

<220>

<223> Synthetic sequence

<400> 127

Gly Ala Gly Ala Ile Phe Gly Ala Thr Gly Gly Val Met Glu Ala Ala
1 5 10 15

Leu Arg Ser

<210> 128

<211> 19

<212> PRT

<213> Artificial sequence

<220>

<223> Synthetic sequence

<400> 128

Gly Ala Gly Ala Ile Phe Gly Ala Thr Gly Gly Val Met Glu Ala Ala
1 5 10 15

Ile Arg Ser

<210> 129

<211> 19

<212> PRT

<213> Artificial sequence

<220>

<223> Synthetic sequence

<400> 129

Gly Ala Ala Val Ile Phe Gly Val Thr Gly Gly Val Met Glu Ala Ala
1 5 10 15

Leu Arg Thr

<210> 130

<211> 19

<212> PRT

<213> Artificial sequence

<220>

<223> Synthetic sequence

<400> 130

Gly Ala Gly Gln Ile Phe Ala Ala Thr Gly Gly Val Met Glu Ala Ala
1 5 10 15

Ser Arg Thr

<210> 131

<211> 19
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 131

Gly Ala Ala Val Ile Phe Gly Thr Thr Gly Gly Val Met Glu Ala Ala
1 5 10 15

Leu Arg Thr

<210> 132
<211> 19
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 132

Gly Ala Ala Pro Ile Phe Gly Val Thr Gly Gly Val Ile Glu Ala Ala
1 5 10 15

Leu Arg Thr

<210> 133
<211> 19
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 133

Gly Ala Gly Val Ile Phe Gly Thr Thr Gly Gly Val Met Glu Ala Ala
1 5 10 15

Leu Arg Ser

<210> 134
<211> 19
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 134

Gly Ala Gly Val Ile Phe Gly Ala Thr Gly Gly Val Met Glu Ala Ala
1 5 10 15

Ile Arg Thr

<210> 135
 <211> 19
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Synthetic sequence

<400> 135

Ser Ala Gly Asn Leu Phe Gly Val Thr Gly Gly Val Met Glu Ala Ala
 1 5 10 15

Ile Arg Thr

<210> 136
 <211> 19
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Synthetic sequence

<400> 136

Gly Ala Gly Ala Ile Phe Gly Ala Thr Gly Gly Val Met Glu Ala Ala
 1 5 10 15

Leu Arg Thr

<210> 137
 <211> 19
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Synthetic sequence

<400> 137

Gly Ala Gly Val Leu Phe Gly Thr Thr Gly Gly Val Met Glu Ala Ala
 1 5 10 15

Leu Arg Thr

<210> 138
 <211> 19
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Synthetic sequence

<400> 138

Gly Ala Ala Ala Leu Phe Gly Val Thr Gly Gly Val Met Glu Ala Ala
 1 5 10 15

Leu Arg Thr

<210> 139
 <211> 19
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Synthetic sequence

<400> 139

Gly Ala Gly Val Leu Phe Gly Thr Thr Gly Gly Val Met Glu Ala Ala
 1 5 10 15

Val Arg Thr

<210> 140
 <211> 19
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Synthetic sequence

<400> 140

Gly Ala Gly Thr Ile Phe Gly Thr Thr Gly Gly Val Met Glu Ala Ala
 1 5 10 15

Leu Arg Thr

<210> 141
 <211> 19
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Synthetic construct

<400> 141

Gly Gly Gly Val Leu Phe Gly Thr Thr Gly Gly Val Met Glu Ala Ala
 1 5 10 15

Leu Arg Thr

<210> 142
 <211> 5
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Synthetic construct

<400> 142

Thr Ile Met Glu Glu
 1 5

<210> 143
<211> 5
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic construct

<400> 143

Thr Ile Val Glu Glu
1 5

<210> 144
<211> 5
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 144

Thr Ile Trp Glu Glu
1 5

<210> 145
<211> 5
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 145

Thr Ile Cys Glu Glu
1 5

<210> 146
<211> 5
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 146

Val Ile Met Glu Glu
1 5

<210> 147
<211> 5
<212> PRT
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 147

Thr Ala Arg Leu Glu
1 5

060513 second sequence listing formatted.txt

<210> 148
 <211> 260
 <212> DNA
 <213> Chlamydomonas reinhardtii

<400> 148
 gcagttgggt caggggctgg cgacgcgctg ctgacgcgca agtgaatggc ccaacaagtc 60
 gcctcgcggt cgctgtcggc gccaaacccg cagctgcatc caccagattc acttgtaga 120
 tcgacctagg ttgcgggacc ggaggcggct cgctgtgcaa gcgcggtgac ctcgtacggc 180
 ggcatggatc gccatctcga ttcgcgcggc agaatcgggc cccgcgcaca ttttaagccgc 240
 gggcgagact catttcgtta 260

<210> 149
 <211> 1181
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Synthetic sequence

<400> 149
 gccagaagga gcgcagccaa accaggatga tgtttgatgg ggtatttgag cacttgcaac 60
 ccttatccgg aagccccctg gccacaaaag gctaggcgcc aatgcaagca gttcgcgatgc 120
 agcccctgga gcggtgccct cctgataaac cggccagggg gcctatgttc ttacttttt 180
 tacaagagaa gtcactcaac atcttaaaat ggccagggtga gtcgacgagc aagcccggcg 240
 gatcaggcag cgtgcttgca gatttgactt gcaacgcccc catttgtgtcg acgaaggcctt 300
 ttggctcctc tgtcgtgtc tcaagcagca tctaaccctg cgtcgccgtt tccatttgca 360
 ggatggccaa gctgaccagc gccgttccgg tgctcaccgc gcgcgacgtc gccggagcgg 420
 tcgagttctg gaccgaccgg ctcgggttct cccgggactt cgtggaggac gacttcgccg 480
 gtgtggtccg ggacgacgtg accctgttca tcagcgcggt ccaggaccag gtgagtcgac 540
 gagcaagccc ggcggatcag gcagcgtgct tgcaagattg acttgcaacg cccgcattgt 600
 gtcgacgaag gcttttggct cctctgtcgc tgtctcaagc agcatctaac cctgcgtcgc 660
 cgtttccatt tgcaggacca ggtggtgccg gacaacaccc tggcctgggt gtgggtgcgc 720
 ggcctggacg agctgtacgc cgagtggctg gaggtcgtgt ccacgaactt ccgggacgcc 780
 tccgggccgg ccatgaccga gatcggcgag cagccgtggg ggcgggagtt cgccctgcgc 840
 gacccggccg gcaactgcgt gcacttcgtg gccgaggagc aggactaacc gacgtcgacc 900
 cactctagag gatcgatccc cgctccgtgt aaatggaggc gtcggttgat ctgagccttg 960
 ccccctgacg aacggcgggt gatggaagat actgctctca agtgctgaag cggtagctta 1020
 gctccccgtt tcgtgctgat cagtcttttt caacacgtaa aaagcggagg agttttgcaa 1080
 ttttgttggg tgtaacgatc ctccgttgat tttggcctct ttctccatgg gcgggctggg 1140
 cgtatttgaa gcttaattaa ctcgaggggg ggcccgtac c 1181

<210> 150
 <211> 260

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<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 150
ccgacgtcga cccactctag aggatcgatc cccgctccgt gtaaattggag gcgctcggtg    60
atctgagcct tgccccctga cgaacggcgg tggatggaag atactgctct caagtgctga    120
agcggtagct tagctccccg tttcgtgctg atcagtcttt ttcaacacgt aaaaagcgga    180
ggagttttgc aattttgttg gttgtaacga tcctccgttg attttggcct ctttctccat    240
gggcgggctg ggcgtatttg                                     260

<210> 151
<211> 520
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 151
ccgacgtcga cccactctag aggatcgatc cccgctccgt gtaaattggag gcgctcggtg    60
atctgagcct tgccccctga cgaacggcgg tggatggaag atactgctct caagtgctga    120
agcggtagct tagctccccg tttcgtgctg atcagtcttt ttcaacacgt aaaaagcgga    180
ggagttttgc aattttgttg gttgtaacga tcctccgttg attttggcct ctttctccat    240
gggcgggctg ggcgtatttg gcagttgggt caggggctgg cgacgcgctg ctgacgcgca    300
agtgaatggc ccaacaagtc gcctcgcggt cgctgtcggc gccaaacccg cagctgcatc    360
caccagattc acttgttaga tcgacctagg ttgcgggacc ggaggcggct cgctgtgcaa    420
gcgcggtgac ctcgtacggc ggcatggatc gccatctcga ttcgcgcggc agaatcgggc    480
cccgcgca ca ttaagccgc gggcgagact catttcgtta                                     520

<210> 152
<211> 30
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 152
atccgtagtt atccttatgg ccatcttagc                                     30

<210> 153
<211> 30
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 153
cgtgcatcga ttaacagctt ctggacctga                                     30

```

<210> 154
<211> 30
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 154
ttaaacgtcg tacgtccaag tataactaag 30

<210> 155
<211> 30
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 155
aatctgatac atgctattca gatcttaca 30

<210> 156
<211> 30
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 156
tcttccatcg taaatctagc atcgattagc 30

<210> 157
<211> 30
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 157
atctgtaata atctagtcga ggcattcaag 30

<210> 158
<211> 30
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 158
aactggctta aatcgtaac aatcgtgtga 30

<210> 159
<211> 30
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 159
gatttaacat aactgtcgat taccgtgcga 30

```

<210> 160
<211> 30
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 160
tatgcttgac aatcgtaat ctggtgacaa 30

<210> 161
<211> 30
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 161
taacaagaat ctggctaatc aatcgatgca 30

<210> 162
<211> 30
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 162
gtagtcggaa tagttactaa cgaggattcg 30

<210> 163
<211> 30
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 163
aaatgtctac tcgactagta aatcgtaact 30

<210> 164
<211> 290
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 164
gcagttgggt caggggctgg cgacgcgctg ctgacgcgca agtgaatggc ccaacaagtc 60
gcctcgcggt cgctgtcggc gccaaacccg cagctgcatc caccagattc acttgtaga 120
tcgacctagg ttgcgggacc ggaggcggct cgctgtgcaa gcgcggtgac ctcgtacggc 180
ggcatggatc gccatctcga ttcgcgcggc agaatcgggc cccgcgcaca ttttaagccgc 240
gggcgagact catttcgtta atccgtagtt atccttatgg ccattcttagc 290

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060513 second sequence listing formatted.txt

<210> 165
<211> 580
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 165
cgtgcatcga ttaacagctt ctggacctga ccgacgtcga cccactctag aggatcgatc 60
cccgctccgt gtaaattggag gcgctcggtt atctgagcct tgccccctga cgaacggcgg 120
tggatggaag atactgctct caagtgtctga agcggtagct tagctccccg tttcgtgctg 180
atcagtcttt ttcaacacgt aaaaagcgga ggagttttgc aattttgttg gttgtaacga 240
tcctccgttg attttggcct ctttctccat gggcgggctg ggcgtatttg gcagttgggt 300
caggggctgg cgacgcgctg ctgacgcgca agtgaatggc ccaacaagtc gcctcgcggt 360
cgctgtcggc gccaaacccg cagctgcac caccagattc acttgtaga tcgacctagg 420
ttgcgggacc ggaggcggct cgctgtgcaa gcgcggtgac ctcgtacggc ggcatggatc 480
gccatctcga ttcgcgcggc agaatcgggc cccgcgcaca tttaagccgc gggcgagact 540
catttcgtta ttaaacgtcg tacgtccaag tatgactaag 580

<210> 166
<211> 566
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 166
aatctgatac atgctattca gatcttaca ccgacgtcga cccactctag aggatcgatc 60
cccgctccgt gtaaattggag gcgctcggtt atctgagcct tgccccctga cgaacggcgg 120
tggatggaag atactgctct caagtgtctga agcggtagct tagctccccg tttcgtgctg 180
atcagtcttt ttcaacacgt aaaaagcgga ggagttttgc aattttgttg gttgtaacga 240
tcctccgttg attttggcct ctttctccat gggcgggctg ggcgtatttg gcagttgggt 300
caggggctgg cgacgcgctg ctgacgcgca agtgaatggc ccaacaagtc gcctcgcggt 360
cgctgtcggc gccaaacccg cagctgcac caccagattc acttgtaga tcgacctagg 420
ttgcgggacc ggaggcggct cgctgtgcaa gcgcggtgac ctcgtacggc ggcatggatc 480
gccatctcga ttcgcgcggc agaatcgggc cccgcgcaca tttaagccgc gggcgatctt 540
ccatcgtaaa tctagcatcg attagc 566

<210> 167
<211> 290
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic sequence

<400> 167
atctgtaata atctagtcga ggcatccaag ccgacgtcga cccactctag aggatcgatc 60

060513 second sequence listing formatted.txt

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cccgctccgt gtaaattggag gcgctcgttg atctgagcct tgccccctga cgaacggcgg 120
tggatggaag atactgctct caagtgtga agcggtagct tagctccccg tttcgtgctg 180
atcagtcttt ttcaacacgt aaaaagcgga ggagttttgc aattttgttg gttgtaacga 240
tcctccgttg attttggcct ctttctccat gggcgggctg ggcgtatttg 290

```

```

<210> 168
<211> 1181
<212> DNA
<213> Artificial sequence

```

```

<220>
<223> Synthetic sequence

```

```

<400> 168
gccagaagga gcgcagccaa accaggatga tgtttgatgg ggtatttgag cacttgcaac 60
ccttatccgg aagccccctg gccacaaaag gctaggcgcc aatgcaagca gttcgcacgc 120
agccccctgga gcggtgccct cctgataaac cggccagggg gcctatgttc tttacttttt 180
tacaagagaa gtcactcaac atcttaaaat ggccaggtga gtcgacgagc aagccccggcg 240
gatcaggcag cgtgcttgca gatttgactt gcaacgcccg cattgtgtcg acgaaggctt 300
ttggctcctc tgctgctgtc tcaagcagca tctaaccctg cgtcgccgtt tccatttgca 360
ggatggccaa gctgaccagc gccgttccgg tgctcaccgc gcgcgacgtc gccggagcgg 420
tcgagttctg gaccgaccgg ctcgggttct cccgggactt cgtggaggac gacttcgccg 480
gtgtggtccg ggacgacgtg accctgttca tcagcgcggt ccaggaccag gtgagtcgac 540
gagcaagccc ggcgatcag gcagcgtgct tgcagatttg acttgcaacg cccgcattgt 600
gtcgacgaag gcttttggct cctctgtcgc tgtctcaagc agcatctaac cctgcgtcgc 660
cgtttccatt tgcaggacca ggtggtgccc gacaacaccc tggcctgggt gtgggtgcgc 720
ggcctggacg agctgtacgc cgagtggctg gaggtcgtgt ccacgaactt ccgggacgcc 780
tccggggccg ccatgaccga gatcggcgag cagccgtggg ggccgggagtt cgccctgcgc 840
gacccggccg gcaactgcgt gcacttcgtg gccgaggagc aggactaacc gacgtcgacc 900
cactctagag gatcgatccc cgctccgtgt aaatggaggc gctcgttgat ctgagccttg 960
ccccctgacg aacggcggtg gatggaagat actgctctca agtgctgaag cggtagctta 1020
gctccccgtt tcgtgctgat cagtcttttt caacacgtaa aaagcggagg agttttgcaa 1080
ttttgttggt tgtaacgatc ctccgttgat tttggcctct ttctccatgg gcgggctggg 1140
cgtatttgaa gcttaattaa ctcgaggggg ggccccgtac c 1181

```

```

<210> 169
<211> 290
<212> DNA
<213> Artificial sequence

```

```

<220>
<223> Synthetic sequence

```

```

<400> 169
gcagttgggt caggggctgg cgacgcgctg ctgacgcgca agtgaatggc ccaacaagtc 60

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060513 second sequence listing formatted.txt

gcctcgcggt cgctgtcggc gccaaacccg cagctgcac caccagattc acttgtaga	120
tcgacctagg ttgcgggacc ggaggcggct cgctgtgcaa gcgcggtgac ctcgtacggc	180
ggcatggatc gccatctcga ttgcgcggc agaatcgggc ccgcgcaca ttaagccgc	240
gggcgagact catttcgtta aactggctta aatcgtaac aatcgtgtga	290

<210> 170
 <211> 566
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Synthetic sequence

<400> 170	
gatttaacat aactgtcgat taccgtgcga ccgacgtcga cccactctag aggatcgatc	60
cccgctccgt gtaaattggag gcgctcggtg atctgagcct tgccccctga cgaacggcgg	120
tggatggaag atactgctct caagtgtcga agcggtagct tagctccccg tttcgtgctg	180
atcagtcttt ttcaacacgt aaaaagcggg ggagttttgc aattttgttg gttgtaacga	240
tcctccgttg attttggcct ctttctccat gggcgggctg ggcgtatttg gcagttgggt	300
caggggctgg cgacgcgctg ctgacgcgca agtgaatggc ccaacaagtc gcctcgcggt	360
cgctgtcggc gccaaacccg cagctgcac caccagattc acttgtaga tcgacctagg	420
ttgcgggacc ggaggcggct cgctgtgcaa gcgcggtgac ctcgtacggc ggcatggatc	480
gccatctcga ttgcgcggc agaatcgggc ccgcgcaca ttaagccgc gggcgatatg	540
cttgacaatc gtaatcctgg tgacaa	566

<210> 171
 <211> 290
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Synthetic sequence

<400> 171	
taacaagaat ctggctaata aatcgatgca ccgacgtcga cccactctag aggatcgatc	60
cccgctccgt gtaaattggag gcgctcggtg atctgagcct tgccccctga cgaacggcgg	120
tggatggaag atactgctct caagtgtcga agcggtagct tagctccccg tttcgtgctg	180
atcagtcttt ttcaacacgt aaaaagcggg ggagttttgc aattttgttg gttgtaacga	240
tcctccgttg attttggcct ctttctccat gggcgggctg ggcgtatttg	290

<210> 172
 <211> 381
 <212> DNA
 <213> Chlamydomonas reinhardtii

<400> 172	
atggccatgg ctatgcgctc caccttcgcc gccgcggtg gcgctaagcc cgctgtccgc	60
ggtgctcgcc ccgccagccg catgagctgc atggcctaca aggtcacctt gaagaccctt	120

060513 second sequence listing formatted.txt

tcgggcgaca agaccattga gtgccccgct gacacctaca tcctggacgc tgctgaggag	180
gccggcctgg acctgcccta ctcttgccgc gctggtgctt gctccagctg cgccggcaag	240
gtcgtgcccgc gcaccgtcga ccagtcggac cagtccttcc tggacgatgc ccagatgggc	300
aacggcttcg tgctgacctg cgtggcctac cccacctcgg actgcaccat ccagacccac	360
caggaggagg ccctgtacta a	381

<210> 173
 <211> 1494
 <212> DNA
 <213> Chlamydomonas reinhardtii

<400> 173 atgtcggcgc tcgtgctgaa gccctgcgcg gccgtgtcta ttcgcggcag ctccctgcagg	60
gcgcggcagg tcgccccccg cgctccgctc gcagccagca ccgtgcgtgt agcccttgca	120
acacttgagg cgcccgcacg ccgcctaggc aacgtcgctt gcgcggctgc cgaccccgct	180
gcggaggcgc ctttgagtca tgtccagcag gcgctcgccg agcttgccaa gcccaaggac	240
gaccccacgc gcaagcacgt ctgcgtgcag gtggctccgg ccgttcgtgt cgctattgcc	300
gagaccctgg gcctggcgcc gggcgccacc acccccaagc agctggccga gggcctccgc	360
cgcctcggct ttgacgaggt gtttgacacg ctgtttggcg ccgacctgac catcatggag	420
gagggcagcg agctgctgca ccgcctcacc gagcacctgg aggccaccc gcactccgac	480
gagccgctgc ccatgttcac cagctgctgc cccggctgga tcgctatgct ggagaaatct	540
tacccggacc tgatccccta cgtgagcagc tgcaagagcc cccagatgat gctggcggcc	600
atggtcaagt cctacctagc ggaaaagaag ggcatcgcg caaaggacat ggtcatggtg	660
tccatcatgc cctgcacgcg caagcagtcg gaggctgacc gcgactgggt ctgtgtggac	720
gccgaccca ccctgcgcca gctggaccac gtcatcacca ccgtggagct gggcaacatc	780
ttcaaggagc gcggcatcaa cctggccgag ctgcccagg gcgagtggga caatccaatg	840
ggcgtgggct cgggcgccgg cgtgctgttc ggcaccaccg gcggtgtcat ggaggcggcg	900
ctgcgcacgg cctatgagct gttcacgggc acgccgctgc cgccctgag cctgagcgag	960
gtgcgcggca tggacggcat caaggagacc aacatcacca tgggtgcccgc gcccgggtcc	1020
aagtttgagg agctgctgaa gcaccgcgc gccgcgcgcg ccgaggccgc cgcgcacggc	1080
acccccgggc cgctggcctg ggacggcggc gcgggcttca ccagcgagga cggcaggggc	1140
ggcatcacac tgcgcgtggc cgtggccaac gggctgggca acgccaagaa gctgatcacc	1200
aagatgcagg ccggcgaggc caagtacgac tttgtggaga tcatggcctg ccccgcgggc	1260
tgtgtgggcg gcggcgggca gccccgctcc accgacaagg ccatcacgca gaagcggcag	1320
gcggcgctgt acaacctgga cgagaagtcc acgctgcgcc gcagccacga gaacccgtcc	1380
atccgcgagc tgtacgacac gtacctcgga gagccgctgg gccacaaggc gcacgagctg	1440
ctgcacaccc actacgtggc cggcggcgctg gaggagaagg acgagaagaa gtga	1494

<210> 174
 <211> 1725

060513 second sequence listing formatted.txt

<212> DNA

<213> *Clostridium pasteurianum*

<400> 174

```

atgaaaacaa taattataaa tgggtgtacag ttttaactg atgaagacac tactatatta      60
aaatttgcac gagacaacaa tattgatata tctgcactgt gttttttaa taattgtaat      120
aatgacataa ataagtgtga aatatgtact gtagaggtag aggggtactgg attagtaaca      180
gcctgtgata cattaattga ggatgggtatg attataaaca caaattccga tgctgtcaac      240
gaaaaaatta aatctagaat atctcaatta ttagacatac atgaattcaa atgtggtcct      300
tgcaatagaa gagaaaactg tgaattctta aaacttgta taaaatataa agcaagagct      360
tctaaaccat ttttacctaa agataagact gaatatgtag atgaaagaag taaatcatta      420
actgtagata ggacaaaatg cttattatgt ggaagatgtg ttaatgcctg tggaaaaaat      480
actgaaacct atgcaatgaa atttttaaac aaaaatggta aaactataat tggagcagag      540
gatgaaaaat gctttgatga tactaattgt ctattatgtg gtcaatgtat aatcgctgt      600
ccagtagcag cattatcgga aaaatcacac atggatagag taaaaaatgc cttaaatgcc      660
cctgaaaaac atgtaatagt agctatggct ccatctgtca gagcttctat aggtgaactt      720
tttaatatgg gatttggcgt tgacgtaaca ggaaaaattt atactgcttt aagacagctt      780
ggatttgata aaatattcga tataaacttc ggagcagata tgacaattat ggaagaggct      840
acagaattag ttcaaagaat agagaataat ggacctttcc caatgtttac atcttgctgc      900
ccaggttggg taagacaagc tgaaaattat tatcctgaat tactaaataa tctttcatca      960
gctaaatcac ctcaacaaat ttttgggtact gctagtataa cttattatcc ttctatatct     1020
ggctctgacc caaagaatgt atttactgta acagttatgc cctgtacttc aaaaaaattt     1080
gaagcagata gaccacaaat ggaaaaagac ggcctaagag atatagatgc tgttataact     1140
actcgagaat tagcaaaaat gattaaagat gctaaaatac catttgctaa acttgaagat     1200
agcgaagcag accctgctat gggagaatac agcgggtgctg gtgccatatt tgggtgcaact     1260
ggcggagtta tggaagcagc ttttaagaagt gcaaaagact ttgctgaaaa cgctgaactt     1320
gaagatatag aatataagca agttagagga ttaaatggta taaaagaagc tgaagtagaa     1380
ataaataaca acaaatataa tgtagctgtt ataaatgggtg cttcaaattt atttaagttt     1440
atgaaatctg gtatgattaa cgaaaaacaa tatcatttca tagaagtaat ggcttgatcat     1500
ggaggatgtg taaatgggtg tggacagcct catgtaaacc caaaagattt agaaaaagta     1560
gacataaaaa aagtaagagc ttctgtattg tataatcagg atgaacatct ttccaagaga     1620
aaatctcatg aaaatactgc attagttaaa atgtatcaaa attattttgg caaaccaggt     1680
gaaggtcgtg cccatgaaat attacacttt aaatataaaa aataa                        1725

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<210> 175

<211> 1265

<212> DNA

<213> *Desulfovibrio vulgaris*

<400> 175

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atgagccgta ccgtcatgga gcgcatcgaa tatgagatgc acactccgga cccaaggcc      60

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060513 second sequence listing formatted.txt

gatccggaca agctccactt cgtccagatc gacgaggcaa agtgcataagg ctgcgacacc	120
tgttcgcagt actgccccac cgccgccatc ttcggcgaaa tgggcgaacc gcactccatt	180
ccccacatcg aggcgtgcat caactgcggc cagtgcctca cgactgccc cgagaacgcc	240
atctacgagg cacagtcgtg gtgcctgaag tcgagaagaa gctgaaggac ggcaagggtga	300
aatgcatcgc catgcccgcc cccgccgtgc gctatgactt gggcgacgcc ttcggcatgc	360
ccgtcggttc cgtcaccacc ggcaagatgc tcgcggccct gcagaagctc ggcttcgctc	420
attgctggga caccgagttc accgctgacg tgaccatctg ggaagagggg tccgagttcg	480
tggaacgcct caccaagaag agcgacatgc cgctgccgca gttcacctcg tgctgccccg	540
gctggcagaa gtatgccgag acctactacc ccgaactgct gccgcacttc tccacgtgca	600
agtcgccccat cggcatgaac ggcgcactgg cgaagaccta cggcgagag cggtatgaagt	660
acgaccccaa gcaggtctac accgtctcca tcatgccctg catcgcaaag aagtacgaag	720
ggttgcgctc cgaactgaag tccagcggca tgcgcgacat cgacgccacg ctgaccaccc	780
gtgagctggc ctacatgatc aagaaggccg gtatcgactt cgcgaaactc cccgacggca	840
agcgtgacag cctcatgggt gaatccaccg gcggtgccac catcttcggc gtcaccggcg	900
gcgtcatgga agcggcactc cgcttcgcct acgaagccgt caccggcaag aagcccgcga	960
gctgggactt caaggccgtg cgcggtcttg atggcatcaa ggaagccacc gtcaacgtcg	1020
gcggtaccga cgtcaaggct gccgtggtgc acggggccaa gcggttcaag caggtctgcg	1080
acgatgtgaa ggcgggcaag tcgccctatc acttcacgca atacatggcc tgccccggcg	1140
gctgcgtctg tggcggcggg cagcccgta tgcccgcggt gctcgaagcc atggaccgca	1200
ccaccacccg cttttacgcg ggcctgaaga agcgcctcgc catggcgagc gccaacaagg	1260
catag	1265

<210> 176
 <211> 1407
 <212> DNA
 <213> Entamoeba histolytica

<400> 176	
atgccaccta aaccatcaca tacactcacc ggacatgacc ataaccatag tattcaattt	60
gattggtcta aatgcatggg ttgtggaatg tgtgtacta aatgtacttt tggggtgtta	120
gtaaaacaac caccaaaaat tccaccattt gttcagccta atagagaaaa actctctcaa	180
gaaaataaccg acaagacaag agtacttatt gatgagtctg aatgtactgg gtgtggtcaa	240
tgttcttttg tttgtaactt tggttctatt acaccaatag accatcttgt tgatactttt	300
aaagctaaag aagctggaag gaagcttggt gctatgattg caccttcaac tcgtttagggt	360
gttgctgagg ctatgggaat gcctattgga agtacagcta tggctcagtt agttcattgt	420
ttaagactta ttggatttga ttatgtattt gatgttgatg ctggagctga taagacaaca	480
atggatgatt atgccgaagt tattgaaatg aaaaaagaag gaaaaggacc tgctattact	540
tcctgttggtc ctgcttggat tgaacttggt gaaaaagaat atcctgactt aattccaaac	600

060513 second sequence listing formatted.txt

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gtctctactg cccgttcacc aattggatgt ttagctgggt gtattaaaag aggatgggca 660
aaggatgtag gaattgcagt agaagatctt tacactgttg gaataatgcc ttgtattgct 720
aaaaaaacag agtctcaaag acaacaaatt catcaagact atgatgcttc atgtacttca 780
aatgaaattg ctgcttattt caaaaaacat cttccacctg aagaatgtaa atttacacaa 840
gaaagagaag aagcacttgc taaaactgaa gatgggtcaat gtgatttacc atttagacgt 900
atttctgggtg gttctaatat ttttggaag actggaggag tttgtgaaac tgtattgaga 960
gtaattgcac gtaatgcagg agttgattgg aacagttgta ctgttaacaa ggaagaaact 1020
tttaaacatg ctgcaagtgg atcaacaatg acaaactctt ctgttgatat tggtggaact 1080
attatcacag gtgctgtttg tcatgggtgg tatgctatta gacatgcttg tgaacttatt 1140
agaaaaggag agttaaagt tgatgttgg gaaatgatgg catgtgttg aggttgtctt 1200
ggaggagcag gtcaaccaa aattccacca gcaaagaaac ttgagatgga taagagaaga 1260
gtaatgttag atattttaga tcaacaaact gatattagag ctgctaataa aaatactgat 1320
gttcttgat ggattgataa acattttgat catcaagggt cacatcagca tcttcacaca 1380
tattttactc ccagatatca aaactaa 1407

```

```

<210> 177
<211> 1350
<212> DNA
<213> Scenedesmus obliquus

```

```

<400> 177
atgcctgagt ggcaaccggg aggtcgggtat gctgtttctg tccgcccgcc agtgaacagg 60
cgggctgtgg tggcagcaga gcgcaggcgc cttgttgtgc gggcagctgg cccaacagca 120
gaatgtgatt gccaccagc tcccgcgccc aaggccccgc actggcagca gacgctagat 180
gagctagcca agcctaagga gcagcgcaag gtgatgatcg cccagatcgc accagcagt 240
cgctgtggta ttgcagagac catgggactc aaccctgggg atgtgacagt tggccagatg 300
gtgaccggcc tgcgcatgct gggctttgat tatgtgtttg acacgctgtt tgggtgctgac 360
ctcaccatca tggaggaggg cacagagcta cggcacaggc ttcaggacca cctggagcag 420
caccacaaca aggaggagcc gctgcccattg ttcaccagct gctgccctgg ctgggtggcc 480
atggtggaga agtccaacc cgagctcatc ccctacctgt cttcctgcaa gtcgccccag 540
atgatgctgg gcgcagtcac caagaactac ttcgctgccg aggccggcgc caagcctgag 600
gacatctgca acgtgagcgt gatgccctgc gtgcgcaagc agggcgaggc tgaccgcgag 660
tggttcaaca ccacaggggc tggcggcgcg aacgtggacc acgtcatgac aactgcagag 720
ctgggcaaga tctttgtgga gcgcggaatc aagctgaacg acctgcagga gtcgcccttt 780
gacaaccccg tcggcgaggg cagcggcggc ggcgtgctgt tcggcaccac tggaggcgtg 840
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gtctttgagg acgtgcgcgg cctggagggc atcaaggagt ccacgctgca cctcaccaca 960
ggccccacca gcccttcaa ggcctttgca ggcgcagacg gcaccggcat caccctcaac 1020
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```

060513 second sequence listing formatted.txt

gagagcaagt acgacttcat cgaggtcatg gcctgccccg gcggctgcat cggcggcggc 1140
ggccagccgc gcagcgcgga caagcagatc ctgcagaagc gccaggcggc catgtacgac 1200
ctggacgagc gcgcggtgat ccggcgcagc cagcagaacc cgctgattgg cgcgctgtat 1260
gagaagttcc tgggcgagcc caacggccac aaggcgcacg agctgctgca cacgcactac 1320
gtggccggcg gcgtgcccga tgagaagtga 1350

<210> 178
<211> 1311
<212> DNA
<213> *Chlorella fusca*

<400> 178
atgtgttgcc ccgtggttgc aagtaggcac gcagggcgtg caaggcatgt tgctgtccgt 60
gcagcagggc caacatctga gtgtgattgt cctccaacac ctcaggccaa gctgcctcac 120
tggcagcagg ctctggatga gctcgccaag cccaaggaga gcaggaggtt gatgatcgcg 180
caaatcgcct ccgctgttcg tgtcgctatt gctgagacca ttggcttggc cccaggagat 240
gtcaccattg ggcagctcgt gactgggctg cgtatgcttg gctttgatta tgtctttgac 300
accctgtttg gtgctgacct gaccattatg gaggagggaa cggagctgct gcatcgccgt 360
caggaccatc tggagcagca cccaacaag gaggagccac tgcccatgtt caccagttgc 420
tgcccaggct gggttgccat ggttgaaaag agcaatcctg agtcatccc ctacctgtca 480
tcttgcaagt cgcctcagat gatgcttggg gccgttatca agaactacta tgcacagcag 540
gttggagtgc agcccagtga catctgcaac gtgtcagtca tgccatgcgt acgcaagcag 600
ggagaggctg accgggagtg gttcaacacc acagggtgcag gccttgcccg tgatgttgat 660
catgtggtga ctactgctga ggttggtgaag atattcctgg agcgtggcat caagctgaat 720
gagctgccag agagcaactt tgacaacccc attggcgagg gcacagggtg tgctctgctg 780
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ccattcatcc aggcgctgta tgacaagttc ctaggcgcac ccaacagcca caaggcacat 1260
gatctgctgc acacacacta tgtggcaggt ggaattccag aggagaagtg a 1311

<210> 179
<211> 717
<212> DNA
<213> Artificial sequence

<220>
<223> Green Fluorescent Protein

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```

<400> 179
atggccaagg gcgaggagct gttcaccggt gtgggtcccca tcctggtgga gctggacggc 60
gacgtgaacg gccacaagtt ctccgtctcc ggcgaggggtg aggggtgacgc cacctacggc 120
aagctgacct tgaagtcat ctgcaccacc ggcaagctgc ccgtgccctg gcccaccctg 180
gtcaccaccc tgacctacgg tgtgcagtgc ttctcccgt accccgacca catgaagcag 240
cacgacttct tcaagtccgc catgcccag ggctacgtgc aggagcgcac catcttcttc 300
aaggacgacg gcaactacaa gacccgcgcc gaggtcaagt tcgagggcga caccctggtg 360
aaccgcatcg agctgaaggg catcgacttc aaggaggacg gcaacatcct gggccacaag 420
ctggagtaca actacaactc ccacaacgtg tacatcatgg ccgacaagca gaagaacggc 480
atcaagggtga acttcaagat ccgccacaac atcgaggacg gctccgtgca gctggccgac 540
cactaccagc agaacacccc catcggcgat ggccccgtgc tgctgcccga caaccactac 600
ctgtccatcc agtccgccct gtccaaggac cccaacgaga agcgcgacca catggtcctg 660
ctggagtctg tcaccgctgc cggcatcacc cacggcatgg acgagctgta caagtaa 717

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```

<210> 180
<211> 320
<212> DNA
<213> Artificial sequence

```

```

<220>
<223> Synthetic sequence

```

```

<400> 180
atccgtagtt atccttatgg ccatcttagc gcagttgggt caggggctgg cgacgcgctg 60
ctgacgcgca agtgaatggc ccaacaagtc gcctcgcggt cgctgtcggc gccaaacccg 120
cagctgcata caccagattc acttgtaga tcgacctagg ttgcgggacc ggaggcggct 180
cgctgtgcaa gcgcggtgac ctcgtacggc ggcatggatc gccatctcga ttcgcgcggc 240
agaatcgggc cccgcgcaca tttaagccgc gggcgagact catttcgtta cgtgcatcga 300
ttaacagctt ctggacctga 320

```

```

<210> 181
<211> 580
<212> DNA
<213> Artificial sequence

```

```

<220>
<223> Synthetic sequence

```

```

<400> 181
ttaaacgtcg tacgtccaag tataactaag ccgacgtcga cccactctag aggatcgatc 60
cccgctccgt gtaaatggag gcgctcgttg atctgagcct tgccccctga cgaacggcgg 120
tggtatggaag atactgctct caagtgtgta agcggtagct tagctccccg tttcgtgctg 180
atcagtcttt ttcaacacgt aaaaagcggg ggagttttgc aattttgttg gttgtaacga 240
tcctccgttg attttggcct ctttctccat gggcgggctg ggcgtatttg gcagttgggt 300
caggggctgg cgacgcgctg ctgacgcgca agtgaatggc ccaacaagtc gcctcgcggt 360

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060513 second sequence listing formatted.txt

cgctgtcggc gccaaacccg cagctgcatc caccagattc acttgtaga tcgacctagg 420
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 gccatctcga ttcgcgcggc agaatcgggc cccgcgcaca tttaagccgc gggcgagact 540
 catttcgtta aatctgatac atgctattca gatcttaca 580

<210> 182
 <211> 580
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Synthetic sequence

<400> 182
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 cccgctccgt gtaaattggag gcgctcgttg atctgagcct tgccccctga cgaacggcgg 120
 tggatggaag atactgctct caagtgtcga agcggtagct tagctccccg tttcgtgctg 180
 atcagtcttt ttcaacacgt aaaaagcggg ggagttttgc aattttgttg gttgtaacga 240
 tcctccgttg attttggcct ctttctccat gggcgggctg ggcgtatttg gcagttgggt 300
 caggggctgg cgacgcgctg ctgacgcgca agtgaatggc ccaacaagtc gcctcgcggt 360
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 ttgcgggacc ggaggcggct cgctgtgcaa gcgcggtgac ctcgtacggc ggcatggatc 480
 gccatctcga ttcgcgcggc agaatcgggc cccgcgcaca tttaagccgc gggcgagact 540
 catttcgtta atctgtaata atctagtcga ggcattcaag 580

<210> 183
 <211> 777
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Synthetic sequence

<400> 183
 atctgtaata atctagtcga ggcattcaag atggccaagg gcgaggagct gttcaccggt 60
 gtgggtccca tcctggtgga gctggacggc gacgtgaacg gccacaagtt ctccgtctcc 120
 ggcgagggtg aggggtgacg cacctacggc aagctgaccc tgaagtcat ctgcaccacc 180
 ggcaagctgc ccgtgccctg gcccaccctg gtcaccaccc tgacctacgg tgtgcagtgc 240
 ttctcccgct accccgacca catgaagcag cacgacttct tcaagtccgc catgcccgag 300
 ggctacgtgc aggagcgcac catcttcttc aaggacgacg gcaactacaa gacccgcgcc 360
 gaggtcaagt tcgagggcga caccctggtg aaccgcatcg agctgaaggg catcgacttc 420
 aaggaggacg gcaacatcct gggccacaag ctggagtaca actacaactc ccacaacgtg 480
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 ggccccgtgc tgctgcccga caaccactac ctgtccatcc agtccgccct gtccaaggac 660

cccaacgaga agcgcgacca catggctcctg ctggagttcg tcaccgctgc cggcatcacc 720

cacggcatgg acgagctgta caagtaaaac tggcttaaata cgtaacaat cgtgtga 777

<210> 184
 <211> 320
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Synthetic sequence

<400> 184
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 cccgctccgt gtaaattggag gcgctcgttg atctgagcct tgccccctga cgaacggcgg 120
 tggatggaag atactgctct caagtgtgta agcggtagct tagctccccg tttcgtgctg 180
 atcagtcctt ttcaacacgt aaaaagcggg ggagttttgc aattttgttg gttgtaacga 240
 tcctccgttg attttggcct ctttctccat gggcgggctg ggcgtatttg gatttaacat 300
 aactgtcgat taccgtgcga 320

<210> 185
 <211> 16
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Synthetic construct

<220>
 <221> misc_feature
 <222> (1)..(3)
 <223> Xaa can be any naturally occurring amino acid

<220>
 <221> misc_feature
 <222> (5)..(7)
 <223> Xaa can be any naturally occurring amino acid

<220>
 <221> misc_feature
 <222> (15)..(15)
 <223> Xaa can be any naturally occurring amino acid

<400> 185

Xaa Xaa Xaa Phe Xaa Xaa Xaa Gly Gly Val Met Glu Ala Ala Xaa Arg
 1 5 10 15

<210> 186
 <211> 8
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Synthetic construct

<220>
 <221> misc_feature
 <222> (3)..(3)
 <223> Xaa can be any naturally occurring amino acid

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<220>
<221> misc_feature
<222> (6)..(6)
<223> Xaa can be any naturally occurring amino acid

<400> 186

Ala Asp Xaa Thr Ile Xaa Glu Glu
1 5